THIS WEEK IN THE

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Meeting Steel Requirements

the Hard Way-

But Still Meeting Them!

A manufacturer of coal mining drills was desperate for $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{1}{4}$ " square tubing needed for drill supports, on an order scheduled for shipment halfway around the world. The required size of tubing was nowhere available, but Ryerson Steel Service was equal to the occasion.

By forming two channels from ½" plate and welding the channels together we were able to deliver several hundred pieces of the required tubing! While such an emergency measure is obviously not always practical, it did make it possible for the customer to complete his order and ship on schedule. And this is but one of numerous instances where Ryerson service has achieved the seemingly unachievable.

There are many requirements that we cannot handle today, but it is often surprising what can be done with the close cooperation of your nearby Ryerson plant. If needed steel is out of stock the Ryerson salesman will sometimes be able to suggest a practical alternate steel, or he may know a way in which flame cutting, forming or welding can serve to provide a workable substitute.

So we urge you to keep in touch with us. Our whole organization is doing everything within its power to help every customer get the steel he needs.



JOSEPH T. RYERSON & SON, Inc., Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston

RYERSON STEEL

IRON AGE

ESTABLISHED 1855

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Rules of Unreason

THERE is an old saying that: "He governs best who governs least."

If that were true, we could congratulate ourselves today on having the best government ever. For there was never a time in the memory of living man when the United States was less governed by constituted authority and more by organized mob rule.

What is mob rule? It is any rule in which an organized minority of any kind can impose its will upon the majority to its detriment and to the advantage of the minority group.

This is not new in this country. There are plenty of beef cattle in our neighboring state of Argentina and they are among the best. Even if the OPA were to make the purchase price attractive, we could not touch this meat in these days of man-made famine because an organized mob of American cattle raisers long ago deprived us of this opportunity. Their henchmen in Congress, through a process known as "log rolling," or in other words: "You scratch my back and I'll scratch yours," jammed through a law preventing the importation of Argentine meat on the ridiculous grounds that it was unsanitary. So now England gets it.

By a similar process, an organized mob of silver producers compelled us to pay far more than the world market price for this commodity and indeed are now planning a new raid through another rise.

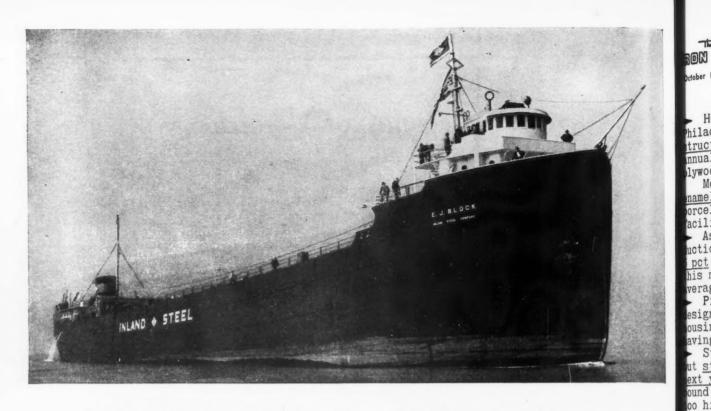
But these are old stories. The process of mob rule has been refined and brought up to date in such fashion as to become one of the wonders of the world. It makes us all wonder, including our international neighbors, to see how a great, big, strong-muscled chap like Uncle Sam can be booted around by pigmies and pismires, the best of whom do not represent one thousandth part of his strength.

John Lewis, boss of a few hundred thousand coal miners, has repeatedly challenged the authority of the President of the United States and of 130 million Americans and has invariably imposed his will upon them. A few thousand men defy the city of Pittsburgh and shut down 80 percent of its industrial and business activities and deprive its people of light and power. A handful of truckmen in New York, having a grievance against a few hundred employers, inconvenience and injure a population of seven million citizens by closing down thousands of chain stores with whom they have no quarrel. Our export trade is not in the hands of our Office of International Trade, but is controlled by a handful of union officials at whose command sea traffic stops. The wheels of industry everywhere slow down and the interests of all Americans are put in jeopardy by minor mob bosses who throw our economy out of balance at will through unauthorized strikes and slowdowns. It is mob rule, pure and simple, and defiance of law and order.

Weak and timid government, national or local, claims lack of legal authority to cope with these abuses. But that is a poor alibi when government still retains its emergency war powers. There have been men in our history who could and would meet these situations, but those in power today are not of that stripe.

Fortunately the public, the patient and long suffering American public is awakening. It begins to see that we need not only new laws but new lawmakers to enforce them for the common good and who have the guts and the grit to enforce the rules of reason for the protection of us all.

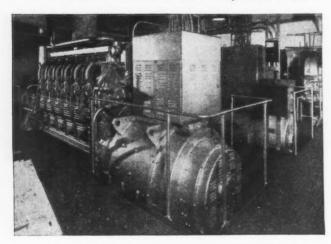
JA Hausenertz



INLAND Ore Freighter First With Diesel-Electric Power

Reconverted and streamlined, with new power, new steering system, new hatch arrangement, increased capacity and a multitude of other improvements, the E. J. BLOCK, of the Inland fleet, recently made her first cargo run, with complete success.

The first lake ore-carrier to be driven by diesel-electric



Power plant of the E. J. Block consisting of two 1200 horsepower diesels driving electric generators. Either one is capable of propelling the ship.

power, the vessel has many revolutionary features, such as hydro-electric steering, direct control of the engines from the bridge, permanent radar installation and new ballast pumps of greatly increased capacity. Me

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The changes in this ship, made by American Ship Building Company, make this a most efficient carrier of raw materials for Inland Steel. With the new power system the E. J. BLOCK is one of the fastest vessels of its type. Either of its two main engines is capable of driving the ship under full load. The new steering system, direct engine-control, and radar installations make for a safer vessel. The improved pumps allow ballast to be expelled more rapidly, and in conjunction with the improved hatch arrangements, allow much faster loading of the 11,000 tons of ore, limestone or other materials.

This advancement in raw material transportation is a part of the Inland program of modernization and expansion . . . a program which will continue to supply more and better steel for American industry.



INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Paul, St. Louis

PRINCIPAL PRODUCTS: BARS . STRUCTURALS . PLATES . STRIP . TIM PLATE . FLOOR PLATE . PILING . REINFORCING BARS . RAILS . TRACK ACCESSORIES

ON AGE clober 15, 1946

NEWSFRO

Housing will take a big bite out of next year's finished steel output. hiladelphia firm has plans afoot to build 10,000 prefabricated houses using steel tructural members and sheet steel walls to the tune of about 40,000 tons nnually. Other prefab builders are using structural steel with aluminum and w lywood. NHA lists 144 prefabricators now qualified for priorities assistance.

Meanwhile inquiries indicate some builders are planning on using porcelain Other prefab builders are using structural steel with aluminum and with

namel for walls in such quantities that, should the business materialize orcelain enameling firms will be severely taxed to handle the volume with present

acilities.

Aside from shortages, a factor often overlooked in lagging automotive prouction is <u>increased absenteeism</u> over wartime rates. GM's current rate is <u>almost</u> pct (1941 rate, 1.9 pct), or 1 out of 20 employees absent each day. In effect his means that the 40-hr wk is thereby reduced to a little over 38 hr on the

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SSORIES

Present short soda ash supplies are faced with further diversion by CPA action esigned to move more soda ash to aluminum plants to boost sheet output for the

ousing program. Foundrymen who use it extensively for desulfurizing have been aving trouble buying it and may have more difficulty getting it next year.

Steel output is expected to roll along at peak levels for the next 2 months ut steel officials are privately wondering if all will be smooth sailing early ext year. The tremendous increase in the cost of food eaten by steel workers is ound to have a bearing on USWA wage demands. If the industry finds the demands

00 high another strike is a distinct possibility.

The newest in cleaning ideas is the use of a <u>bright anneal at 1500° F to liminate pickling</u>. One shop experimenting with the process has had very encourging results in eliminating pickling preparatory to enameling kitchenware. Recognition of the profound effect of lubricating compounds used on the urface of forging dies on the quality of the work produced, production speed and ie and equipment life led Curtiss-Wright to test such compounds for optimum erformance.

Results of these tests proved the excellent performance of a low viscosity, platile oil with a small percentage of colloidal additive serving as the vehicle

or suspending the graphite. Not only was an improvement effected in die life but aving of 87½ pct in cost of the compound was realized.

By a method of filtration followed by vacuum distillation, Germany was able to refine aluminum airplane scrap that it became suitable for reuse in all but

be most critical aircraft parts.

By adding an excess of molten magnesium to crudely refined melted scrap luminum alloy, insoluble intermetallic compounds of aluminum and magnesium with ther elements were formed and then filtered out as crystals when the mixture was oled to near solidification. The remaining mixture was heated in a hydrogen tmosphere at a pressure of 2 mm Hg in a closed furnace.

Arthur Scrivener, Ltd. of Birmingham, England, claims for its patented piston—

finding machine provision of the only method of generating a taper from an

regular outline to a true circle.

As now produced, this machine can handle a piston with a maximum diameter of in. and a maximum length below the lands of 6 in. The work spindle is driven

al hp motor with speeds up to 2800 rpm.
Following the death of a leading test pilot in a mysterious accident, the ritish De Havilland aircraft firm issued a statement that his plane, the DH 108 d unofficially surpassed the record speed of 616 mph recently set by the Gloster teor. The craft broke up in midair and preliminary reports conflict as to lether it struck a "solid wall" shock wave in approaching the speed of sound or bether the jet turbine unit exploded.

Paris reports indicate that a <u>new tube mill has been ordered in America</u> for le Valenciennes & Denain Tubes Co. in France. The firm is a subsidiary of Phain & Anzin steelworks, and will replace an obsolete welded tube plant.

British Iron & Steel Federation officials recently revealed that Erpects to import 2 million tons of steel ingots from America in 1947. England ons are now under way for the imports and some key American steel officials are England. British coastal mills would use 25 pct, while the remainder will be ipped by rail to the Midlands.

"Birds," says William B. Stout, noted inventor, "Are not very good flyers.

"Birds," says William B. Stout, noted inventor, "Are not very good flyers.

"Insects, he says, fly sucsfully with payloads and with wings proportionally smaller than birds; and they y faster, he added, in discussing a new approach to the flight problem.

Wire Forms and Stampings Make Good

The attractive production possibilities of wire forms and stampings, used either separately or in combination, are discussed in this article. While little has been published in the past on this small in size but high production minded industry, the author herein cites numerous examples of the profitable use of wire forms and stampings and explains in detail the technique and equipment used to form wire, ribbon and other sectional shapes in wire forming machines.

PARTS formed from wire and from narrow strip or ribbon stock constitute one of an important class of metal products. Uses number many thousand and the products enter scores of industries entirely divorced in most other respects from metal-working, in addition to being applied as components of diversified metal products.

The stamping industry is a large fabricator of parts made from strip and ribbon stock but, in the average plant, it works these chiefly or entirely in stamping presses, commonly overlooking the possibilities of wire forming machines or forgetting that they are adaptable to ribbon as well as to forming wire of circular and other sectional shapes. Makers of stampings often buy wire forms to combine with stampings and hundreds of manufacturers buy stampings and

wire forms from different makers for assembly into various products.

Being well aware of the utility of both wire forms and stampings, whether used separately or in combination, the Eastern Tool & Mfg. Co., Belleville, N. J., has developed, over a 35-yr period, one of the largest production rates of any maker of wire forms. At the same time, it makes effective use of light stampings.

In its new plant, this company operates more than 150 wire forming machines, many of which include light built-in stamping presses, as well as numerous conventional stamping presses that often are run independently of wire forming operations. Frequently these presses work on wire components partly or completely formed previously. Also used are special presses for coining operations, some special welding

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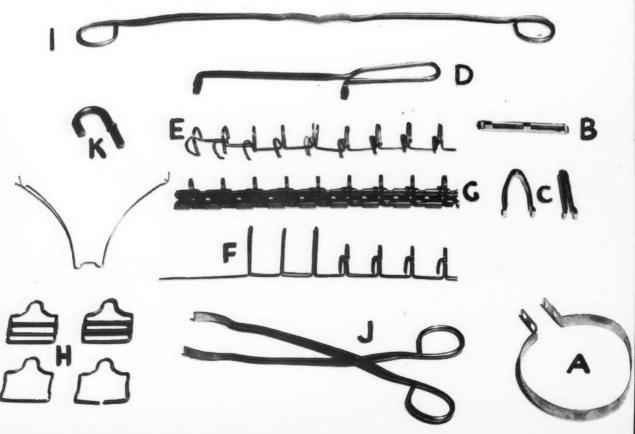
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FIG. I—Typical wire forms and stampings. Production of these items are discussed in this article.



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FIG. 2—Forming setup for producing the stainless steel wire shape shown in the foreground.

machines and a variety of supplementary equipment. The company's toolrooms carry nearly 7000 sets of dies, the greater proportion of which are owned by customers, but a sizable proportion are for making "staple" types of wire forms and light stampings.

Some slight idea as to the diversity of products manufactured can be obtained from fig. 1 and some other illustrations accompanying this article. These products were selected from a group in process on a single day and include only a small fraction of the total being made at the time. As the machines used are capable, in many cases, of turning out one part a second, short runs are rapidly completed and, as a rule, about half the machines are being set up for new runs while others are in operation.

It is not unusual, however, to receive orders for several million parts from a given set of tools, in which case the machines used may run continuously, two shifts a day, for several days or as long as current short supplies of the wire or ribbon required hold out. Materials used include steel and nonferrous metals in numerous analyses and degrees of hardness and finish. Brass, bronze, aluminum, copper, stainless steel and various special alloys are worked.

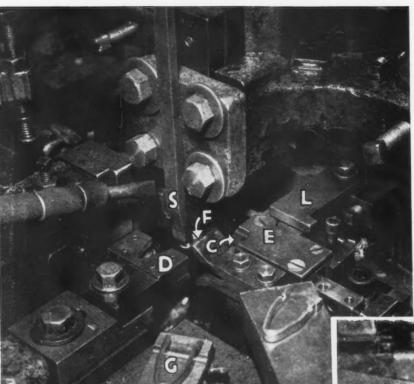
Although many forms of springs (excepting coil springs) are made, a large proportion of the output is in soft materials some of which are in ready-plated condition and some unplated. Much finishing after fabrication is also done and products that are more economically heat-treated after fabrication are handled in this way.

Most wire forming is done on Nilson four-slide machines many of which include a light press for doing such operations as piercing, blanking, flattening, notching, embossing and the like, usually before the wire or ribbon stock is cut off. In general, the wire is first run through straightening rolls. Then, in successive operations, the wire is fed to length, undergoes a press operation if needed, and then is cut off and formed. As a rule, the form proper is fixed and centrally located and shapes the inner portion of the piece as the respective slide tools (or dies) are advanced in precisely timed sequence by cam action to bend the wire around the form.

In simple setups, forming is all done in one plane, but often forming in two or more planes is required

FIG. 3—Silex parts of polished stainless ribbon are produced on this machine.





F IG. 4—A U-shaped electrical part (shown at C, fig. 1) in copper is formed and slotted with this setup.

and is effected by any one of several tooling expedients, each adapted to the particular part to be made. Occasionally, such operations as looping around pins, twisting, upsetting or slotting are done in addition to any press operations that precede forming. Whenever possible (or feasible within the tooling cost permitted), the part drops from the machine completed but there are uncounted cases in which supplementary operations are required.

Thus, the wire form may have to receive supplementary forming, welding, coining, assembly, tumbling or plating, depending upon its shape, specifications, qualities required and other variables. Some such work is done in separate stamping presses or in special machines. For many products, the primary and secondary operations are done to best advantage on stamping presses, no wire forming machine being used. Often a press is used to assemble a wire form and a stamping or two or more parts of either type. If quantities warrant, expensive semiautomatic setups involving dial or magazine feeds are applied. In other cases, hand assembly is necessary or proves more economical for the quantity ordered.

To produce a wire form such as that in the foreground of fig. 2 from hard 0.050-in. diam stainless steel wire, the latter must first be run through two rotary straighteners. After cutting off to correct length, the wire is forced against the form, the shank of which is at F, by the front die D and side dies, one of which is at S. As these dies close, all bends in the horizontal plane are completed. The rear die R also closes in sequence and pivoted blocks, one of which is seen at B, on the end of this die, are rocked upward to clamp the ends of the wire. On the sides of dies marked S are inclined projections one of which is

shown at P, and, as the side dies close, these projections force the ends of the wire upward and form the hooked ends of the piece. As the dies make their return strokes, the piece drops finished into a chute below the form.

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Flat stainless steel ribbon 0.040-in. thick and 7/16-in. wide, prepolished, is used for the Silex clamps shown in partly completed and in finished form in the foreground of fig. 3 and at A, fig. 1. This ribbon is fed through straightening rolls between the dies of a small horizontal press forming part of the machine, but not visible in this view. As the press dies close after feeding is completed, four holes are pierced, two in the front end of one piece and two in the rear end of the next piece. A short section is also blanked out to



FIG. 5—Setup employed in forming a padlock loop (K, fig. 1).
The collar is also upset in this operation.

provide the rounded ends of the two pieces. A set of debossing dies in the press form a trade mark and lettering on the side of the piece.

A piece thus blanked automatically feeds into the forming position where its center is against the form F, fig. 3. Front die D and side dies S then close and perform the first forming operation along with the rear die R which bends the ends back at right angles. To finish the piece, it is dropped to a lower level where it comes in contact with other portions of the four dies and is given its final shape against the lower step of the form. Actually, two pieces are formed at once, one at each level, so that a finished part drops from the machine as the dies make their return stroke. At G, fig. 3, is the gage which the finished part must fit.

Fig. 4 shows, in the foreground, an electrical part

made from copper strip 1/4-in. wide and 1/8-in. thick. The part can also be seen against the form at F from which it is about to be pushed by the stripper S. Forming is done partly by the front die, D, and partly by side dies one of which is at E. Inside the latter is a slotting cutter the tip of which is seen at C. This tip is withdrawn until forming is completed but, before the side dies open, the lever L on the rear slide is advanced and rocks the holder for the cutter which is advanced to shear the metal and form a slot. There is a duplicate cutter in the die at the opposite side not seen in this view. At G, the part is shown in a gage after forming. This is an unusual setup but indicates that a wire form machine can be adapted to do slotting in the forming position.

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Subsequently, this part is sent to a stamping press and is closed to its final shape seen at C, fig. 1, using the die, S, and the form, F. A hollow punch, P, is then advanced to telescope over the blank and when the latter bottoms in the punch hole, the collar is upset by further motion of the slide.

After the punch is withdrawn, the die, S, is also withdrawn and the piece falls into a channel, coming to rest at a lower level. When the die, S, again advances against the upset piece at the lower level, the U-bend is made against the form in the usual way and the formed piece drops from the press as the die makes its return stroke. Later, another die is used in a punch press to cut slots in the long leg of the piece.

In making most wire forms, the wire is fed to length and is cut off before being formed but in the setup, fig. 6, progressive forming of a round steel wire part for a binder is done without cutting off until several forming operations are completed. These produce a

> series of duplicate hooks of continuous wire which is bent back upon itself and then is shaped into hooks, as indicated by the partly and completely finished elements E and F, fig. 1. The U-shape loops are first made in one plane and then are formed to hook shape in a second plane at right angles to the first plane. Initial forming is done by horizontal slide tools in the foreground and then other tools form the hooks around the mandrel extending from center to right of fig. 6. As formed, the work is fed along this mandrel and finally is cut

FIG. 7—Combination machine for forming and welding closed loops (H, fig. 1).

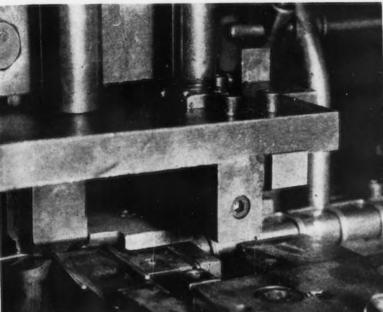
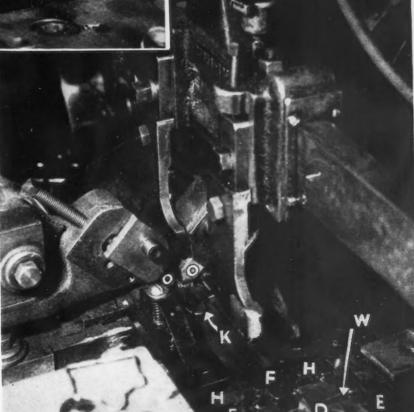


FIG. 6-Arrangement of wire forming machine for continuous production of a looseleaf binder element (E and F, fig. 1.)

a cam die. Although a part of this shape could be finish-formed in a wire forming machine, if quantities were sufficient to warrant the necessary tooling, the same result is attained in this case, with lower tooling cost, by doing the secondary forming in a stamping press.

Another part that indicates the versatility of the wire form machine is the U-shape loop for a padlock (K, fig. 1) made from 7/32-in. round steel wire at the rate of 35 to 40 pieces per min. The unusual feature of this part is the collar upset, near the center of the long leg. Fig. 5 shows the setup in which this part is formed. After being cut off to length, the blank is fed to the position at A where it is gripped at the long end (subsequently bent) between the end of



THE IRON AGE, October 17, 1946-51



FIG. 8—Progressive die for forming and assembling paper fast-eners from three strips of zinc plate ribbons. These fasteners are shown at B, fig. 1.

off by a solenoid-operated tool when a specified length is attained. Later, this length is assembled by hand to a stamping as shown at G, fig. 1.

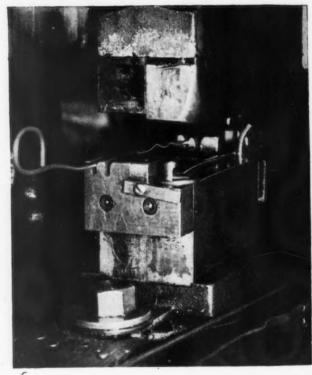
Among hundreds of diversified wire products made for the garment and related trades are so-called "dandy" frames four of which are shown at H in fig. 1. These frames are used on overalls and are produced in million lots. Those shown in fig. 1 include a closed loop made from round steel wire and subsequently assembled to a stamped cross bar which is formed around the wire in automatic machines, after initial blanking, piercing and forming in a stamping press. Forming of the loop of steel wire is done by the dies in the foreground of fig. 7, the form itself being marked F. A length of wire fed in and already cut off is shown ready for forming at W. The first stage of forming is done by die D which shapes the hump portion against the form F, the ends simultaneously being bent at right angles round the secondary forms H, which are then automatically lowered to clear while dies E, on a second slide, complete the forming by bringing the L-shape ends around the sides of the form F, there being no slides closing from the side in this special machine.

When the dandy frame is completely formed, it is stripped from the form as the latter is automatically lowered and is immediately advanced automatically to the position shown at K. There the free ends come to rest in a pair of welding dies with the electrodes, O, lowered at a 45° angle. These electrodes complete the circuit through the ends of the wire as they are pressed together and a resistance weld is made almost instantly, making the loop continuous. As the welding is done, the dies for forming are returned automatically and start forming a new piece. The machine runs through a complete cycle 60 to 70 times a min., ejecting a finished welded loop at least once a second.

Among many parts completely stamped from ribbon stock and not dependent upon wire forming machines is the paper fastener shown at B, fig. 1 and also on the ledge of the die in fig. 8. Three ribbons of bright zinc plated stock are fed simultaneously into this die, one 5/8-in. wide, from the left side and two, 1/4-in. wide, coming in parallel from the back.

In the first stage of the progressive die, the 5/8-in. ribbon has flanges formed on each side to produce a channel section. This channel is then advanced to the central position where a pair of channel-shape clips with a return bend in each flange are dropped into the channel. These clips have been formed in a rear portion of the die on the prior stroke and are sheared off to drop crosswise into the larger channel.

At the third and final station, the flanges of the main channel are formed inwardly to produce a C-shaped edge, in which the clip slide but, at the ends of the



F IG. 9—Coining die used for producing flats on light tongs (I fig. 1) after forming from 1/8-in. wire.

flanges, they are closed together to keep the clips from sliding out. In the same position, a slot is pierced in each end of the piece and it is sheared off with rounded ends and is ejected from the die, falling into a tray. The tray is on a conveyor belt that runs across the end of the die and is seen in right background of fig. 8.

Fasteners are thus produced complete and assembled at the rate of 1 per sec and are automatically counted out 50 to a tray. When a tray load is completed, it is removed by a worker who packs the fasteners with other parts made in another machine and shifts the tray back to an approach position for refilling. The press runs unattended except for incidental observa-

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52-THE IRON AGE, October 17, 1946

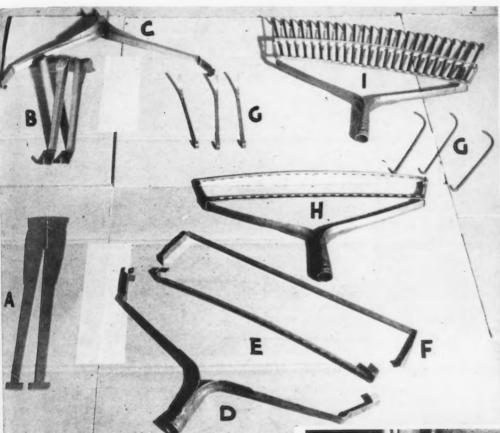
tion by a worker who does packing at an adjacent bench.

Many parts produced from round wire in wire forming machines require coining or extruding operations or both that are too severe to perform in the light presses with which the wire forming machines are often equipped. In such cases, the part is formed and then is shifted to a coining press die, such as is shown in fig. 9. This die is used in a 100-ton coining press to produce the flats on light tongs. The partly flattened wire is also shown at I, fig. 1 and in completed and assembled form, after cutting apart and plating, at I fig. 1.

There are two positions in the die, fig. 9, partly because flats in planes at right angles have to be pro-

nibs are passed through mating holes in the ends of the blade and then are headed over to fasten the blade permanently to the frame-handle. This results in an inexpensive slicing knife and indicates how the utility of a wire form can be increased by coining and extrusion operations.

Fig. 10 illustrates how effectively parts made on forming machines and stamping presses are combined to make a lawn rake, the tynes of which are of blued spring steel and are replaceable when worn or broken. The main frame is completely stamped and formed, providing a socket for a wooden handle. Remaining parts are shaped initially on wire forming machines but require subsequent press operations in assembly (done without rivets in stamping presses) and some



LEFT

FIG. 10 — Stamped and wire-formed parts which, when assembled, produce the head for the lawn rake shown at top right.

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BELOW

FIG. 11—Setup for a forming operating on the main frame of the lawn rake. The part formed in this operation is shown at lower right.

duced. In the left position, the center portion of the wire form is flattened and simultaneously is bent to the arc that later forms one end of the tongs. At the right side of the die, a long flat is formed at each side of the pivot rivet where the two sections are joined subsequently in assembly. Later, the flattened form is sheared apart in such a way as to produce a serrated tip at the ends opposite the finger loops.

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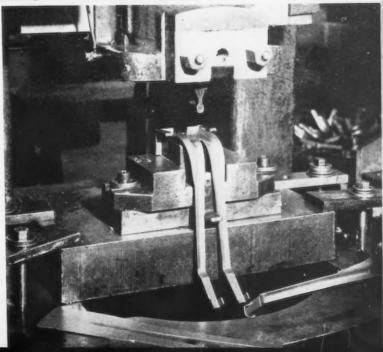
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Another wire form that requires coining is the knife handle, shown at D, fig. 1. Like the tongs, this form is made from copper coated steel wire of ½-in. diam. In the coining die, the extension above the space for the knife blade is flattened on both faces and each end of the wire is flattened on one face. In the center of each of the latter flats a nib or integral rivet is extruded upward, the metal flowing into holes in the die to form the nibs. When the frame thus coined (in a 100-ton press) is assembled to the knife blade, the



require both forming and piercing.

Production of the main frame starts with blanking the shape A, fig. 10, from strip stock. After forming the ends of this portion to shape B, the latter is placed in the die, fig. 11, and there is formed to the shape C, fig. 10. In another die, the forming of the handle socket is completed, resulting in the piece marked D, fig. 10. Parts E, F and G are very simply and rapidly made from ribbon stock in wire forming machines but E and F have to be pierced for the tynes and E requires a press operation to bow it in the plane of the flat side. Next, parts D, E and F are placed in the die,

fig. 12, which forms the ends over to produce the assembly H, fig. 10. which is complete except for inserting tynes through the holes previously pierced to receive them, an operation done by hand. When the tynes are in place, the



FIG. 12—Die in which three frame components of a lawn rake head are assembled without using rivets or screws. An assembled frame is shown in the operator's hand.

looped inner ends of all are bent down in a simple press die and the assembly is completed except for painting.

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German Methods for Refining Aluminum Airplane Scrap

ILTRATION, followed by vacuum distillation, was Fused in Germany for refining aluminum airplane scrap, according to a report of the Combined Intelligence Objectives Committee. This process was said to produce metal suitable for reuse in all but the most critical aircraft parts.

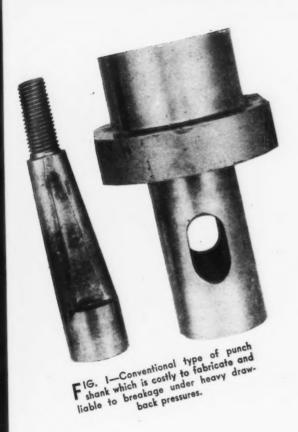
The filtration method was used by I. G. Farben at Bitterfeld. An excess of molten magnesium was added to crudely refined melted scrap aluminum alloy. This resulted in the formation of insoluble intermetallic compounds of aluminum and magnesium with iron, manganese, silicon, chromium, vanadium, molybdenum, titanium, zirconium, and cerium. These compounds could be filtered out as crystals when the mixture was cooled to near the point of solidification.

The remaining mixture was heated in an atmosphere of hydrogen at a pressure of 2 mm mercury in a closed furnace. By this means, all the remaining metals except copper and small amounts of nickel and tin were distilled out.

Aluminum aircraft scrap delivered to the Bitterfeld plant was sorted and prepared with a minimum of hand labor. Scrap containing aluminum alloys was charged into the stack of a gas burning furnace which had two sloping hearths. Melted aluminum and other components with low melting points flowed down a sloping channel into a rectangular forehearth which had a capacity of approximately one ton. When one forehearth was filled, the flow was directed into the other. Unmelted iron and other scrap was raked out through a door in the upper level of the hearth.

An electrolytic pot furnace was used by Vereinigte Aluminum Werke for complete refining of the melted aluminum scrap coming from the stack furnace. The carbon bottom of the furnace served as the anode, and a 15 to 20 cm layer of pure molten aluminum floating on the top of the pot as the cathode. Three carbon electrodes suspended in the pure aluminum layer completed the circuit. A bath of mixed fluorides, 8 to 10 cm deep, underlay the pure aluminum.

Magnesium was first removed from the melted scrap aluminum alloy by adsorption in a cryolite and aluminum bath. The alloy was then introduced through a side opening in the pot furnace into a pool of 28 to 30 pct Cu-Al alloy. The aluminum content of the scrap tended to migrate upward through the fluoride bath into the pure aluminum. The residue settled as sludge on the floor of the pot.



OMPOUNDS used on the surface of forging dies may have a profound effect upon the cost of operations, the quality of the work produced, the speed of production, and the life of the dies and equipment. An investigation at the propeller plant of the Curtiss-Wright Corp., showed that the compound then in use consisted of a mixture of a run-of-refinery oil and graphite. Results obtained with this were neither consistent nor satisfactory since the operator did not always stir the mixture before swabbing the dies and punches. As graphite has a higher specific gravity than oil, this naturally settled to the bottom of the container and resulted in the die surfaces being coated with oil only.

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Normally, the oil serves merely as a vehicle to hold the graphite, and when contacted by the hot workpiece is dispersed as fumes, leaving the graphite film as a working lubricant. Experience indicated that a measured, uniform film is most desirable, otherwise a lack of lubrication will result, causing build-up or scratches on the workpiece, and packing or crowding the dies to the extent that there is not a full flow or formation of the metal. This condition reduces the life of the dies and also increases the drawback pressure, thereby enlarging the possibility of breaking the punch shank and damaging the forging units as a whole. In some cases, this drawback pressure was so great that standard punch shanks, as show in Fig. 1, were suffering constant breakage. To overcome this, the shanks were redesigned as shown in Fig. 2. Not only were these new shanks twice as strong, but the fabricating costs were reduced to about one quarter.

Improving the strength of shanks, however, was merely incidental in the search for a better lubricant, and it was decided to reverse the common prac-

Forging Costs Cut By Improved Die Lubricant

By LAMBERT R. PISTOLES

Paterson, N. J.

tice of using a heavy cylinder stock or black oil, and use instead a very low viscosity, volatile oil with a small percentage of a colloidal additive serving as the vehicle for suspending the graphite and aiding in its dispersion on the tools and the forging blank. The oil selected was a mid-continent oil with a viscosity of 135 at 1000°F.

Tests were conducted, using a regular production die fabricating 836 pieces, and excellent results were obtained immediately. The new compound definitely showed better distribution capacity of the graphite around the dies and punches, and it was found necessary to use only one fourth of the quantity previously used. Fig. 3 shows the test piece employed. The original wall thickness of the tubing





Fig. 3-Test piece used in checking the merits of different die lubricants.

can be seen at the thin end. The work was heated in an induction heating machine to $2150\,^{\circ}\,\mathrm{F}$, upset in one stroke of the press,¹ and cooled slowly in mica.

¹ For further information on this process, see "Upsetting Tubular Members Simplified by Grippers," The Iron Age, Aug. 15, 1946.

The new compound, containing 10 pct of 300 mesh graphite cost only 10¢ per lb, as against 20¢ for the original material, and since only one quarter of the quantity is required there is a net saving of 87½ pct on the basis of cost per lb of the old material Of equal, or even greater, importance, however, is the improvement effected in die life, and indications are that this may be doubled or trebled as a result of the improved lubrication. The new material is easier to apply and spreads more readily, thus making it more

desirable from the point of view of the operator. It is more volatile, and there is consequently much less chance of explosion due to trapped gases, and there is a noticeable reduction in the amount of smoke created. Also advantageous from the user's standpoint is the fact that the substance is entirely stable and requires no agitation or dilution.

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Swabbing is still used to a considerable extent, but it is believed that even better results can be obtained, particularly on large or complex shaped forgings, if the substance is applied by means of a mechanical spray. This should make possible a more regular coat, and produce still greater economies, experience having indicated that an extremely small amount evenly distributed, will give far superior results than will a greater quantity applied by swabbing.

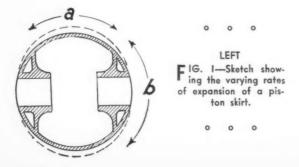
Taper Form Grinding of Piston Skirts

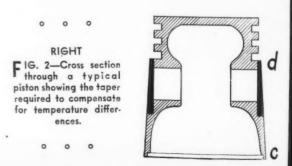
ARYING rates of expansion of the piston of an internal-combustion engine present a series of interesting problems for the designer, the engine manufacturer, the maker of the grinding machine, and the user. It has been impossible in the past to manufacture on a commercial basis the ideal shape of piston, a shape dictated by technical considerations.

In the first place, it will be readily seen that the expansion of the two sides of a piston, fig. 1, carrying the piston-pin bosses (b) is bound to be considerably greater than that of the thrust faces (a), so that the obvious solution would be to grind the piston skirt slightly oval, making the diameter across the thrust faces greater than the diameter across the piston-pin axis, the ellipse being no greater than is necessary to ensure that the piston at this point becomes a true circle when heated under working conditions. The general practice in the past has been to relieve the portion

around the bosses either in the initial casting or in the subsequent machining operations, but the amount of relief provided at these points (especially when this is undertaken in the casting) is so excessive that these portions of the piston become so much lost area as far as bearing surface is concerned.

Another problem is presented by the mass of metal in the head in direct contact with the heat of explosion, compared with the thin shell and the lower temperature at the open end. If a piston were made of sufficient length, there would exist under working conditions a shape which at the one end would consist of a considerable irregular mass of metal distorted by intense local heating to a shape which is quite out of true roundness, while at the other end, if the skirt were sufficiently long, there would be a thin-walled tube at room temperature, without any distortion and therefore a true circle. Between the intensely-heated and





irregularly-distorted head and the truly-round open end of such an imaginary piston is to be found the actual shape of a piston as now used.

Common practice is to machine the upper portion of the piston, forming the lands of the rings to a smaller diameter, relying upon the rings to provide what bearing surface there is at this point. As the skirt immediately below the lands is at a higher temperature than the open end, theoretical and practical considerations demand that the former portion shall be finished to a smaller diameter than the other, necessitating a slight taper from the open end (c) down to (d), fig. 2. The Scrivener patented piston-grinding machine, manufactured by Arthur Scrivener, Ltd., Birmingham, England, shown in fig. 3, provides, it is claimed, the only method of generating a taper from an irregular outline to a true circle, and therefore capable of producing a piston form which will comply with the theoretical considerations just outlined.

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The principle of this machine can be followed by reference to the diagram, fig. 4, and the detail photograph, fig. 5, from which it will be seen that the whole of the work-holding assembly, comprising table, work spindle, and driving motor, is arranged to pivot slightly on the horizontal plane about a point (a) located approximately under the faceplate carrying the piston. On to the rotating work spindle is keyed a cam (b) of suitable contour for the work, this cam revolving against a fixed abutment, so that on each complete revolution of the work the piston and table swing inward and outward four times according to the particular portion of the skirt diameter (fig. 1) which is being presented to the wheel, that is, outwards for the first thrust face (a, fig. 1) inwards for the first boss side (b, fig. 1) and so on. In this manner, each of the boss portions of the skirt is suitably relieved, the exact amount of such relief or ovality being accurately determined by the contour of the cam.

Coming next to the problem of taper, as the lands of the piston head are usually machined below size, this portion of the work remains untouched in this operation, the work being so located on the faceplate that the lands project beyond the face of the grinding wheel. The amount of taper on the skirt is conveniently and accurately controlled by sliding the cam along the splined work spindle, the fixed abutment roller being likewise moved to correspond, so that the further this cam is moved from the work, the smaller the amount of taper ground on the skirt, and vice versa. The pivoting point is also moved in fixed relationship to the cam controlling the ovality.

The work spindle is hollow, and is provided with quick-acting drawbar and wrist pin for driving the work, operated by hydraulic cylinder and quick-release pin at the rear of the machine. The drive is from a 1 hp electric motor fitted with 3-speed pulley. Movement of the work head from and toward the grinding wheel for the purpose of loading and unloading is effected by a suitably shaped cam plate operated by hydraulic slide.

As now produced, the machine can handle a piston with a maximum diameter of 6 in., and a maximum length below the lands of 6 in. A 20x6-in. wheel is used, driven by a 20 hp motor at 1440 rpm. The work spindle is driven by a 1 hp motor with speeds up to 2800 rpm.

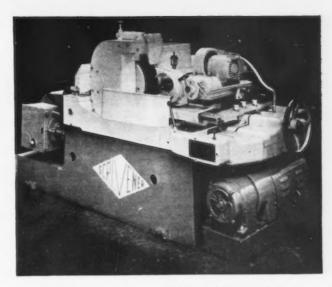


FIG. 3—Scrivener piston grinding machine which automatically produces an oval contour tapering to a full circle.

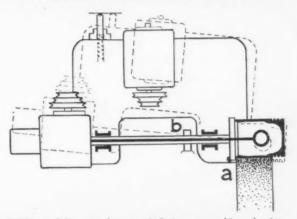


FIG. 4—Schematic layout of Scrivener machine showing the principle of operation.

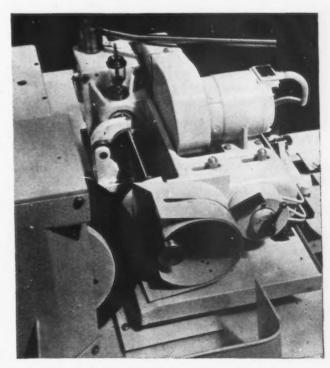


FIG. 5—Closeup of the operating head of the Scrivener machine.

Quick Methods

By J. E. GARSIDE

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For Identifying Metals

A review of quick, yet simple, methods of identifying ferrous and nonferrous metals to determine chemical composition and some physical characteristics are presented herein. Tabular comparisons of reactions of various metals to spot, electrographic, blowpipe, lathe chip and magnet tests are given.

THE use of grinding sparks as a means of determining the chemical composition of steel and other ferrous materials is a well-tried method. Satisfactory results may be obtained with the use of such simple equipment as a light, portable grinder, a pair of safety goggles and a set of standard steels.

This article is condensed from a report which appeared in the British journal, Metal Treatment, under the title "Metallic Materials Inspection."—Ed.

It should be kept in mind, however, that spark testing is of a qualitative nature only, and that such testing is best carried out by comparing the sparks from a material of known chemical composition with the spark stream given by the material under examination. Testing conditions should be maintained constant; for example, testing should be made with one type of wheel and a peripheral wheel speed of at least 4000 ft per min should be used. Working in complete darkness is unnecessary.

The spark stream characteristic of wrought iron consists of long, moderately bright carrier lines, each of which thickens strongly at the end, followed by a fairly dull arrowhead that is separated from the remainder of the spark stream by a small gap. With steels, as the carbon content increases up to about 0.6 pct, the carrier line ends in bursts or forks and the stream itself becomes brighter. Beyond 0.6 pct C the spark stream becomes duller, while the bursts become smaller, but more complicated in nature.

Nickel can only be recognized when the carbon content is low; when this is so, nickel may be identified by the short, sharply outlined dash of brilliant light appearing just before the burst. Molybdenum may be recognized at a minimum concentration of about 0.2 pct by the detached arrowhead rather like that of wrought iron and to be administration and to pussel 2.31

Probably the simplest of all the alloying elements to

identify in steels is tungsten. This element imparts a dull red color to the spark stream, especially in the immediate vicinity of the wheel. In addition the spark stream is shortened and the carbon burst decreased in size, or even eliminated entirely. A red spark stream is also characteristic of ferrous materials other than those containing tungsten, for example, cast iron. In this case, however, there are usually other characteristics which may be employed to effect a differentiation.

An ancillary test to the spark test is the pellet test. In this test, grindings from the specimen after sparking are collected, passed through a 100-mesh sieve, and the larger pellets examined under a low-power microscope. The pellets from various materials vary characteristically in shape, texture and color and so permit of identification. Details of pellet test characteristics are given in table I.

A third method of determination is magnetic testing which is often useful as a sorting test to determine whether or not a material is magnetic. This may be done by observing whether the material under investigation is capable of deflecting a small compass needle.

The carbon content of a steel may be determined with considerable precision by the use of the Carbanalyser. The results obtained with this instrument, however, require careful interpretation since the permeability of a steel specimen is dependent not only upon carbon content and the content of alloying elements, but also upon such factors as the presence of internal strains.

Variation in the magnetic properties of a steel produced by variation in chemical composition may be detected by the use of an electromagnetic device in which the indicator is a cathode-ray tuning indicator. This testing device consists essentially of a pair of air-cored transformers the secondaries of which are connected to the cathode-ray tuning indicator. When using this instrument it is the difference between a standard steel specimen and the sample under investigation (both of which must be of equal diameter) which is measured under the influence of equal alternating magnetic fields. The primary windings of the air-cored transformers are connected in series to an ac supply; the secondary windings are also connected in series, but in opposition to one another. Thus, if with a standard steel specimen inserted in one transformer and and unknown specimen inserted in the second transformer, the combined secondary output applied to the valve is found to be zero, itmcan be concluded that the two steels are identical in chemical composition. If the slightest composition difference exists between the standard steel and the steel sample under investigation, the secondary windings will deliver an output which when amplified by the valve causes a deviation on the cathode-ray tuning indicator.

A method used for both rough, qualitative identification of the elements in a sample of alloy and also for the precise quantitative determination of chemical composition is spectrochemical analysis. A simplified form of the spectroscope that has proved valuable for the identification of a number of elements occurring in alloys is the Hilger Spekker Steeloscope. In this instrument, the operator is required to observe whether a certain line or group of lines is present in the portion of the spectrum under examination through the eyepiece. The Steeloscope does not require a highly trained operator and it is usually possible in a matter of minutes to determine whether the metallic elements normally existing in steels are present. This instrument may also be used for the examination of nonferrous metals.

Spot tests, although essentially qualitative, if properly carried out are capable of producing most useful information as to the elements present in a sample. In some cases such spot tests may be regarded as semi-quantitative. Spot tests may readily be carried out by a person not trained in the more precise

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- (1) Nitric Acid Test: One or two drops of concentrated nitric acid are placed on the clean metal surface. Any reaction that takes place within 1 or 2 min is observed and the reagent is then diluted with three to four drops of water and the reaction is again observed. If solution turns green or blue it is used for the iron nail test.
- (2) Iron Nail Test: A clean iron nail is rubbed in the colored acid solution in contact with the specimen. If the alloy contains copper, copper will be deposited on the nail or the metal surface.
- (3) Ammonia Test: A portion of the metal is dissolved in nitric acid (Aqua regia is used for stainless steel, Inconel, etc.). After diluting the acid somewhat, ammonium hydroxide is carefully added to the solution until the latter is strongly alkaline. If copper or nickel is present, a pale blue precipitate will form which on further ammonium hydroxide addition becomes a dark blue solution.
- (4) Spot Test for Nickel: Reagents used in this test are a—bromide water; b—nitric acid (sp gr 1.2) 1 part; citric acid (50 pct) 2 parts; dilute phosphoric acid (5 cc "syrupy" in 100 cc) 2 parts; dimethylglyoxime (saturated solution in alcohol) 1 part. One

TABLE I
Physical Tests for the Determinations of Metallic Materials

Material	Pellet T	est / fter Sparking	Magnet Test	Lathe Chip Test	Blowpipe Test
Gray cast iron			magnetic	short chips (½ in.)	moderate melting speed; quiet slag; quiet puddle
Austenitic nickel iron			non-magnetic		
Plain carbon steel	dark, rounde	d, smooth surfaces	magnetic	long, often continuous	fast melting; quiet slag; puddle sparks
Nickel steel			magnetic		*
Chromium steel	gray, frosty c	olor; rounded particles	magnetic		
Tungsten steel			magnetic	,	
Molybdenum steel	(high carbon	hollow hemispheres	magnetic		
Vanadium steel	black, trunca	ted (hollow shells)	magnetic		
Straight-chromium stainless			magnetic		
Manganese steel			non-magnetic		
18-8 (or 25-12) stainless			non-magnetic		
Inconel or similar alloys			non-magnetic		
Nickel			magnetic	cuts easily; smooth edges; can be continuous	melts more slowly than steel; less slag that Monel; quiet puddle
Monei .			slightly magnetic at 68°F	cuts easily; smooth edges; can be continuous	melts more slowly than steel; considerable quiet slag; quiet puddle
Nickel silver		-	non-magnetic	smooth, long, often continuous chips	moderate melting speed; fumes
Brass			non-magnetic	smooth, long chips; more brittle than copper	moderate melting speed; gives off fumes puddle like water
Tin bronze			non-magnetic	smooth long chips; more brittle than copper	fast melting, some fumes; puddle like wate
Aluminum bronze			non-magnetic		
Copper 591 box c21 at	Tosis Mes. 7	edated proclamate	non-magnetic	smooth, long, easily cut chips	slow melting; very little slag; puddle bubble
Aluminum	Test No. 128	section)	non-magnetic	smooth chips; saw edges where cut; chips can be continuous	very fast melting; quiet black scum forms quiet puddle
Magnesium alloy	Test No. 5-	coloriesa	non-magnetic	short, easily cut chips	ead
no precipitate in abs	tin	coloriess	non-magnetic	cut by knife; any shape chip	melts very fast; quiet slag, duff gray coating quiet puddle
Lead-silver solder	Test No. 5	colorioss	non-magnetic	harder than lead; any shape chip	slower melting than Pb or P625Wz nit-bas
Lead-tin solder			non-magnetic	harder than lead; any shape chip	faster melting than Pb-Ag; about same as

drop of (a) is placed on the surface of the steel and left to become decolorized. Four drops of (b) are added and allowed to remain for 10 min when six drops of (c) or sufficient to make the drop permanently red are added. The liquids are stirred and left for 2 to 3 min. If there is a fair amount of nickel present, 1.5 pct min, the red precipitate can be seen floating in the drop.

A disk of fairly close-grained filter paper is placed on the mouth of a beaker and the liquid is removed from the steel by laying the open capillary end of a rather long drawn-out jet tube almost horizontally in the middle of the drop. This liquid is so removed that it falls on the center of the paper, each drop being allowed to spread before the next is added. When all the liquid and precipitate are transferred, it is washed in three to four drops of cold water. A scarlet spot is indicative of the presence of nickel.

(5) *Test for Tin:* The clean metal surface is treated with a few drops of a 2.5 pct aqueous solution of silver nitrate. If tin is present, a black deposit with a white precipitate will form.

(6) Cupric Chloride Test: This test serves to distinguish 18-8 and similar stainless steels from low-iron, nickel-base alloys such as Inconel. One drop of a 10 pct solution of cupric chloride in concentrated hydrochloric acid is placed on a cleaned portion of the metal surface. It is allowed to react for 2 min and then three to four drops of water are added. This is followed by washing. The high-iron alloys will develop a copper colored spot on the metal surface.

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(7) Spot Test for Manganese: Reagents used in this test are a—bromine water (saturated solution); b—nitric acid (sp gr 1.2), and c—sodium bismuthate. One drop of (a) is placed on the surface of the steel and left to become decolorized. Two drops of (b) are added and permitted to remain for 2 to 3 min. The drop is removed in the manner described in test No. 4 to a white tile and a minute amount of (c) is placed in the center of the drop. A purple color indicated manganese. Since all ordinary steels contain some manganese (usually up to about 1 pct) a pale purple color will be produced. However, in the case of steels

TABLE II
Spot Tests for Ferrous and Nonferrous Metals

Material	1 Nitric Acid	2 Iron Nail Test	3 NH ₃ Test	Other Spot Tests*
Gray cast iron	reacts; brown to black solution		red-brown	Test No. 4-no red color
Austenitic nickel iron	reacts slowly; brown to black solution		red-brown	Test No. 4-intense reaction
Plain carbon steel	reacts; brown solution		red-brown	Test No. 4—no red color
Nickel steel	reacts; brown to greenish-black solution		red to purple	Test No. 4—red color, intensity correspond to amount of nickel
Chromium steel	reacts; brown to black solution		brown-green	Test No. 4—no red color in nickel-fre steels Test No. 8—purple color
Tungsten steel	reacts slowly; brown solution, yellow sediment		red-brown	See reference (8)
Molybdenum steel	reacts; brown to black solution		red-brown	Test No. 9-pink color
Vanadium steel	reacts; brown to black solution		red-brown	See reference (8)
Straight chromium stainless	no reaction		brown-green	Test No. 4—no red color Test No. 8—purple color
Manganese steel	reacts; brown solution		red-brown	Test No. 7—red color
18-8 (or 25-12) stainless	no reaction		reddish blue	Test No. 4—intense red color Test No. 6—copper deposits on dilution Test No. 8—purple color
Inconel or similar alloys	no reaction		blue-red	Test No. 4—intense red color Test No. 6—no copper is deposited
Nickel	reacts slowly; pale green solution	negative	blue	Test No. 4-intense red color
Monel metal	reacts; greenish-blue solution	copper plates out	dark blue	Test No. 4-intense red color
Nickel silver	reacts; bluish green solution	copper plates out	dark blue	Test No. 4—red color varies in intensit with nickel content
Brass	reacts vigorously; green solution	copper plates out	dark blue	Test No. 4—no red color in nickel-fre
Tin bronze	reacts vigorously; blue-green solution	copper plates out	dark blue	Test No. 11a
Aluminum bronze	reacts vigorously;blue-green solution	copper plates out	white precipitate; blue solution	Tests Nos. 10, 11a and 11b
Copper	reacts vigorously; blue-green solution	copper plates out	dark blue	Test No. 11a
Aluminum and aluminum base alloys	soluble		white precipitate	Tests Nos. 12a, 12b and 12c
Magnesium and magnesium-base alloys	soluble		coloriess	Test No. 12a
Lead	soluble		coloriess	Test No. 5—no precipitate
Lead-silver solder	soluble		coloriess	Test No. 5—no precipitate in absence of tin
Lead-tin solder	soluble		coloriess	Test No. 5—black deposit with white precipitate

^{*} Numbers given in this column refer to the numbers in the text preceding the description of the various spot tests.

containing 12 to 14 pct Mn an intense purple color will result.

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(8) Spot Test for Chromium: Reagents for this test are a-concentrated hydrochloric acid, 1 part; hydrogen peroxide (20 vol) 1 part; b-sodium hydroxide (20 pct aqueous solution) 1 part; hydrogen peroxide (20 vol) 1 part; c-diphenyl carbazide (1 pct solution in glacial acetic acid) 1 part; diluted sulfuric acid (1 + 3) 1 part. Since the carbazide solution slowly loses strength, it should not be more than 14 days old. Two drops of (a) are placed on the steel surface and permitted to remain for about 10 min. (An almost immediate green coloration of the drop is a good indication of chromium; it might be useful as a sorting test). The drop is transferred to a watchglass and 3 to 4 drops of (b) are added, stirred well and left for 1 min. The drop is transferred to a piece of filter paper as in test No. 4 and when it has finished spreading, a succession of single drops of (c) are added around the edge of the wet patch. If chromium is present, bands of purple are produced at the points where the reagent (c) penetrates into the steel solution. Scarlet patches are due to local alkalinity and are to be ignored. The lower limit of detection is about 0.1 pct chromium.

(9) Spot Test for Molybdenum: Reagents used in this test are a-saturated solution of bromine in hydrochloric acid; b-distilled water; c-2.5 pct aqueous solution of potassium ethyl xanthate (this solution should be freshly made daily); hydrochloric acid, 5 pct aqueous solution, and e—isopropyl alcohol. Four drops of (c) are run onto a disk of filter paper, an effort being made to have them spread as evenly as possible. Two drops of (a) are placed on the surface of the steel and left to become decolorized. Three drops of (b) are added and transferred to the center of the previously prepared filter-paper disk. This is washed three or four times with three drops of (d) added to the center of the paper. Three drops of (e) are run into the center of the spot; allowed to dry and then repeated. The presence of molybdenum is indicated by a pale pink, generally rather narrow, ring slowly moving out from the center while the alcohol is spreading. The molybdenum ring fades slowly after about 20 min. Papers treated with solution (c) and allowed to dry may be kept for at least 3 months before use.

(10) Spot Test for the Separation of Aluminum Bronze from High-Tensile Brass: A small area of the surface of the part under examination is cleaned of all dirt, scale and grease and onto this freshly prepared surface one or two drops of sulfuric acid (1 volume of concentrated sulfuric acid to 2 volumes of water) are placed. After about 10 to 15 sec a drop of the indicator given below is added. If the part is made of manganese bronze, a grayish purple spot appears; but if it is of aluminum bronze the resulting spot is greenish yellow.

Indicator solution: 4 g mercuric chlorise; 4.50 g ammonium thiocyanate; 0.01 g silver nitrate; 0.75 g ammonium persulfate and 50 cc distilled water.

(11) Test for Distinguishing Silicon Bronze from Other Brasses and Bronzes: a—Nitroprusside Test: Reagents used for this test are: a—sodium nitroprusside, 5 pct aqueous solution; b—hydrogen peroxide (5 vol of 20 vol hydrogen peroxide diluted to 100 vol with distilled water). A small amount of drillings or turnings are placed in a test tube and covered with (a). The end of the test tube is held over a bunsen

TABLE III
Spot Tests for the Identification of Light Metals

	Solution				
Material	HNO ₃	NaOH	нсі	CdSO	
Pure aluminum	none	white		none	
Aluminum-copper	none	black	black remains		
Aluminum-copper-nickel	none	black	black remains		
Aluminum-copper-zinc	none	black	black removed	gray	
Aluminum-silicon	nono	grayish- brown	color remains		
Aluminum-silicon-copper	none	gray	color remains		
Aluminum-silicon magnesium	none	grayish- brown	color remains		
Aluminum-magnesium	none	white		gray	
Aluminum-magnesium-silicon	none	grayish- brown	color removed		
Aluminum-magnesium- manganese	none	white		gray	
Magnesium	white	none			

flame until the solution boils for 1 to 2 min. The test tube is then removed from the flame and after a few seconds the solution is decanted from the drillings. The test tube is washed with water without removing the drillings and a little of (b) is added. The surface of silicon bronze drillings immediately turns dark blue in color while gunmetal is unaffected. This test will also differentiate silicon bronzes from 95-5 tin bronze, manganese and aluminum bronzes and the brasses such as 97-3, 90-10, 70-30, aluminum brass, Admiralty and high tensile brasses. Copper and cupro-nickel will also give a reaction with nitroprusside.

b—Ammonium Sulfide Test: With ammonium sulfide both silicon bronzes and gunmetal give a black stain when a spot of this solution is applied, but this is not shown with brasses containing manganese, aluminum or tin, or the manganese and aluminum bronzes. Copper and 97-3 and 90-10 brasses give a black stain with this reagent.

(12) Light Metal Tests: a—Spot Test for the Identification of Light Metals: Necessary chemicals for this test are (a) 30 pct aqueous solution of nitric acid; (b) sodium hydroxide solution (20 g of caustic soda dissolved in 80 cc water); (c) 5 pct aqueous solution of hydrochloric acid, and (d) cadmium sulfate solution (5 g cadmium sulfate dissolved in 95 cc water). One drop of (a), (b) and (d) are placed on three separate, clean metallic surfaces and the reactions noted. Identification is effected by reference to table III. If the drop of (b) gives rise to a black stain, the remaining liquid is wiped off and a drop of (c) is added to see whether the color is removed. Further reference to table IV will either confirm or alter the previous deductions.

b—Spot Test for Nickel in Aluminum-Base Light Alloys: One drop of 20 pct aqueous solution of sodium hydroxide is applied to the surface of the specimen and the reaction is allowed to proceed for 1 to 2 min. Two drops of 50 pct aqueous solution of nitric acid is applied plus two drops of a 1 pct solution of dimethyl-

	TABLE IV	
Typical	Electrographic	Tests

Element Sought	Developer	Color	Interfering Elements
Bismuth	10 pct aqueous solution of potassium iodide	orange	load
Cadmium	Hydrogen sulfide gas	yellow	metals forming black sulfide
Chromium	3 pct solution of hydrogen peroxide	yellow, changing to violet in developer	
Cobalt	5 pct ammoniacal benzoin oxime în alcohol	green	
Copper	0.5 pct solution of rubeanic acid in alcohol	black	
Iron	5 pct aqueous solution of potassium thiocyanate	red	
Lead	1 pct solution of potassium chromate in normal acetic acid 10 pct aqueous solution of potassium iodide	yellow	silver bismuth
Molybdenum	Saturated solution of potassium ethyl xanthate in 5 pct sulphuric acid	purple	
Nickel	1 pct solution of dimethylglyoxime in concentrated ammonia solution	scarlet	
Silver	1 pct aqueous solution of potassium chromate	brick red	

glyoxime in ammonia. A rose-colored precipitate indicates the presence of nickel.

c—Spot Test for Manganese in Aluminum-Base Light Alloys: One drop of 20 pct aqueous solution of sodium hydroxide is applied to the surface of the specimen and allowed to react for 1 to 2 min. Two drops of 50 pct aqueous solution of nitric acid are added and mixed well. This is followed by sprinkling a small quantity of sodium bismuthate onto the drop. In the presence of alloying contents of manganese, a purple coloration gradually develops.

Another analytical method which is readily capable of providing valuable results when applied to metallic materials is electrographic analysis. One advantage of electrographic analysis is that in addition to rendering possible the detection of a metal, it is also possible to determine the mode of distribution. In addition, under carefully standardized conditions, a semi-quantitative result may be obtained. The voltage applied to the electrographic apparatus varies from 4 to 6 v. Table IV gives details of some typical working conditions.

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Structural Shapes Produced by Welding

WHEN the acute shortage of structural shapes threatened to delay the completion of a bridge repair job for the city of Cleveland, the Park Iron & Welding Co. found an answer to the problem by suggesting the fabrication of I beams and angles through the use of welding. The idea was approved by the city bridge engineer, and the results surpassed all expecta-

tions. Using continuous arc welding, with the work held in a fixture, the company fabricated I beams of excellent quality up to 33 ft long, using steel plate of varying thicknesses up to $\frac{5}{8}$ in. In addition, about 3 miles of structural angles have been made, and over 15,000 ft of bridge railing.



FIG. 1—Method of constructing a large 1 beam by automatic welding.

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Power Factor v. Input in Electric Furnace Melting

NE of the important considerations in the operation of direct arc electric furnaces used for steel making is that of obtaining the maximum power input to the furnace at the best power factor possible. E. H. Browning, Westinghouse Electric Corp., in a paper "Power and Power Factor in Arc Furnace Operation," presented at the annual meeting Assn. of Iron and Steel Engineers, Cleveland, discussed this phase of electric furnace operation. At present, whether or not the best power factor possible can be had for any particular furnace installation depends in the majority of the cases on the operator's ability to choose his tap voltage and adjust his electrode positioning regulator so as to exactly fulfill requirements set down by the electrical circuit characteristics.

Three-phase furnaces of the direct arc type range in size from about 500-lb capacity at 250 kva to about 100-tons capacity at 20,000 kva, the latter a furnace of six electrodes and two transformers. The electrical equipment required for the operation of such furnaces was described by the author. In a circuit containing both resistance and reactance and having a constant applied voltage, such as an electric arc furnace circuit, the theoretical maximum power input is obtained when the value of the circuit resistance equals the absolute value of the circuit reactance. Current increases beyond a definite value result in a decrease of useful power, efficiency and power factor.

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Of great importance in the operation of direct arc electric furnaces is the proper selection of tap voltages and corresponding arc current values. This is frequently left to the judgement of the operator, and results depend upon his experience and ability. The choice of the secondary voltage partly depends on the nature and form of the charge, heat receptivity of the charge, type and condition of the refractory and bath agitation. However, once a voltage has been selected, the arc current value resulting in maximum power input to the furnace at the best power factor is fixed by the furnace electrical circuit constants. Thus, a chart of maximum values of current as determined by test, to be used with each tap voltage utilized dur-

To help the melter achieve the conditions of opti-

mum power input at a satisfactory power factor the use of three secondary single phase watt meters in place of the presently used three single phase ammeters was suggested. The operator could then adjust his furnace regulator to get maximum input by reference to the watt meters, permitting a more evident means of indicating the correlation between the adjustment of the regulator current adjusting rheo-

stats and the power input to the furnace.

The use of auxiliary equipment in the control circuit of the furnace electrode positioning regulator has been pointed out as one method of prohibiting the use of excessive arc currents. Such an arrangement consists of using relays and resistors such that the regulator is recalibrated for each tap voltage so that the current that can be obtained is limited at the maximum to give a value which results in the maximum power factor for the maximum power input to the furnace with that particular tap voltage. The operator can use a lesser value of arc current and obtain less power input at a higher power factor, but the minimum power factor and maximum arc current are automatically limited for each operating voltage. This has been tried and has indicated an improvement in power factor over that previously obtained.

It appears the best approach to the problem of achieving satisfactory power factors and desired furnace power input comes about through determining by test the nature and constants of electrical circuit of

each furnace.

Once this is done and data collected, characteristic curves of the given furnace can be plotted and conditions for optimum operation set up. These curves will indicate differences in magnitude and condition between total circuit power and the useful power actually available in the furnace. This information can be used as an aid for the furnace operator or for the application of auxiliary equipment to the furnace regulator such that improper operation is automatically avoided.

New Books

Standard Metal Directory." Tenth edition (the first new edition since 1943) contains more than 7000 detail reports on steel mills, foundries, smelters and rolling mills. Plants are listed geographically and alphabetically and financial data and names of top officers and products made, materials used and basic plant equipment are given. Atlas Publishing Co., 425 W. 25th St., New York 1. \$10, 852 p.

Report to the People." A factual, unemotional report on the wartime plant design and construction activities of Stone & Webster Engineering Corp. Though plainly written, the book gains dramatic emphasis from the magnitude of the activities it coversplants ranging from 30 cal. ammunition making through the atomic bomb project. The book is well illustrated and presents a readable picture of vital role played by Stone & Webster in the construction

of more than a billion dollars worth of war plants. Stone & Webster Engineering Corp., 90 Broad St., New York. 150 p.

"A Plant Technical Information Service," by R. Howard. Detailed procedures for setting up a technical information service within a plant to permit full utilization of published technical information is described in this English monograph. Three main phases covered are the scope and use of such a service, sources of information the mechanics of index, filing, and preparing bibliographies. Emmott & Co., Ltd., 31 King St. W, Manchester 3, England.

"The Industrial Republic," by P. W. Litchfield. The views of the chairman of the board of the Goodyear rubber as he wrote them in 1919, a year after the conclusion of World War I, and again in 1946, a year after the defeat of the Berlin-Tokyo Axis. Among the subjects that come under Mr. Litchfield's analytical pen are government, unionism, production and industrial democracy. Goodyear Tire & Rubber Co., Akron, Ohio, 224 p. \$4.

A Practical Method Of

Selecting the Correct

ANY engineers and technical men still believe that cast iron is a soft, weak, brittle, open-grained material suitable for little more than sash weights and grate bars. Most available engineering handbooks still list physical properties as of 20 or 30 yr ago.

It has been noticed that many engineers and foundrymen do not appreciate the factors which influence physical properties of castings. They do not seem to realize the full effects of varying the carbon equivalent, the cooling rate, or the section size. It has frequently been found that engineers expect to find the same physical properties in a heavy or light section of a casting, as are exhibited in the standard ASTM 1.20 in. arbitration bar. While it is possible to correlate engineering data on the standard arbitration bar, engineers and foundrymen must keep in mind when selling or buying castings that the controlling section of the casting is the decisive factor in meeting the specifications. In other words, castings having thinner or heavier sections than the 1.20 in. bar will not possess the properties exhibited by it. An examination of the fundamental factors effecting the physical properties show that such expectations are entirely

In the past 20 yr, gray iron has progressed from a material having little engineering properties to a

* Mr.-Hambley is now general manager, Slinger Foundry Co., Slinger, Wis., and general manager, foundry division, Falls Mfg. Co., Menomonee, Wis.

material having very favorable engineering properties such as high tensile strength, excellent wear, good impact, high hardness and high castability. With these thoughts in mind an attempt has been made to clarify the fundamental factors involved in the production of gray iron castings for engineering purposes. For over 5 yr, data have been collected on melting histories, including mixtures, melting and pouring temperatures, inoculants and general cupola control. This information has been correlated with physical properties and chemical analyses with the view of furnishing the engineer with tools to enable him to properly specify the grade of material he desires in any section. The collection of this material was also done with the purpose of furnishing the foundryman with data from which he can determine the proper iron to meet a given specification.

Since this information was originally intended for the engineers of Allis Chalmers, covering the irons with which they had to deal every day, it was decided that the test was to be on a production basis and not on a laboratory scale. All irons investigated were used in the production of commercial castings.

The irons were melted in the cupolas under normal conditions and inoculated according to our standard practice to prevent chilled edges and hard spots. The cupolas used are divided into three melting units of three cupolas per unit. The first unit consists of a 72-in., a 65-in., and a 45-in. cupola, the two larger being equipped with a hot blast system. This unit provides for jobbing work weighing from a few ounces to 100 tons or more and from class 70 to class 20 iron. The other two units are production units supplying mechanized molding units and usually melt class 20 and class 30 irons. Two cupolas in each unit are of

65-in. diam while the third in each unit is either 36-in. or 45-in., being used as auxiliary cupolas. The metal was melted hot, above 2750°F, depending upon the cupolas from which the samples were taken. It should be emphasized again that all the irons tested were unalloyed gray irons used in daily production and machined in production.

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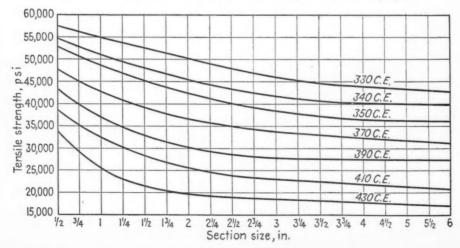
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Each class of iron was poured into eight different sized sections, ranging from 1/4x1 in. to 6x6 in. All bars were 10 in. long in order to obtain sufficient test pieces. The molds were made in green sand taken from the heaps on the various floors. After pour-

Fig. I—Relationship of section size and tensile strength in irons of varying CE.



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By K. R. GEIST

Technical Engineer in Charge, Precision Casting Section, Engine and Condensor Dept., Allis Chalmers Mfg. Co., Milwaukee

and

W. A. HAMBLEY*

Works Metallurgist, Allis Chalmers Mfg. Co., Milwuakee.

Melting histories, including mixtures, innoculants and melting and pouring temperatures, collected at the Allis Chalmers' plant over the past five years, are correlated in this article with physical properties and chemical analyses with the view of furnishing the engineer with adequate information for specifying the proper grade of iron for a given section. This information will also serve the foundryman in enabling him to determine the proper iron to meet specification.

ing, the blocks were left to cool in the sand over night. The blocks were then cut up for test in the research laboratory where all testing was carried on in a regular routine manner. An 0.375 in. tensile bar was cut from the $\frac{1}{2}$ in. section. The 0.75 in. and 1 in. sections were machined to 0.505 in. tensile bars (which are the standard bars at Allis Chalmers). Both 0.505 in. and 1.250 in. tensile bars were machined from the 2, 3, 4, and 6-in. sections. In the 4-in. and 6-in. series, bars were machined from the outer portion as well as from the center of the section. Brinell hardnesses were taken on each broken tensile bar and across the test blocks and photomicrographs and chemical analyses were made from the broken tensile bars. Each series was completely analyzed. In addition, each test bar was tested for total carbon and silicon.

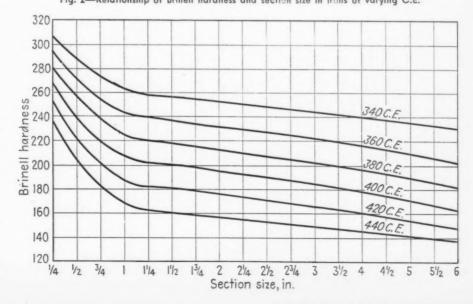
In order to present the data in a usable form, the carbon equivalent values are used throughout this article. It has been proven that it is more practical to use the carbon equivalent (expressed hereafter as

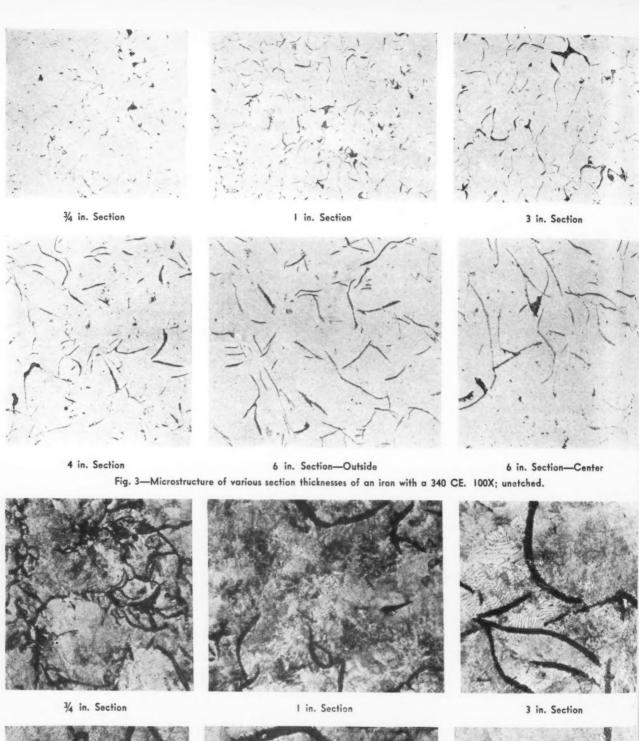
CE) than to try to correlate on carbon or silicon content. It was decided to use the formula CE = TC + 0.3 (Si + P) for it is a little more accurate, and to avoid argument with high phosphorus iron advocates. However, the values found by using the formula CE = TC +1/3 Si are very close to those from the other formula, due to the consistently low phosphorus ranges used, 0.08 to 0.18 pct P. It is only when high and low phosphorus irons are compared and when the values approach the entectic that any real difference exists.

None of the graphs or charts were plotted until the tests were completed for a series and it was gratifying to find that when plotted the points fell so close to the average line. Tests run 5 yr apart fell into line and it should be emphasized that the results are not from only one set or series of iron.

The composite results of all tensile tests are given in fig. 1, plotting tensile strength for a given analysis against section size. Note the 430 CE starts at 34,000 psi in the $\frac{1}{2}$ in. section and levels off quite rapidly so that from the 2 in. section up it shows very little change. When the CE is near the eutectic value, the slope of the line in the thin sections is rather steep. The steepness of the line indicates the relative sensitivity of the metal to variations in cooling rate. Hence, it can be seen by comparing an iron with a CE of 430 with an iron with 340 CE that the higher CE metal is more sensitive to variations in cooling rate. This is entirely in agreement with observations in the foundry and machine shop. The so-called high test irons, which are those with a low CE, do not show a marked difference in hardness, strength or appearance

Fig. 2—Relationship of Brinell hardness and section size in irons of varying C.E.





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1 in. Section 3 in. Section 3 in. Section

4 in. Section—Outside 6 in. Section—Outside 6 in. Section—Center FIG. 4—Microstructure of same iron as fig. 3, but at greater magnification, 500X; 1 pct nital etch.

of the fracture when there are section variations in casting.

A very interesting theory was advanced some time ago that if the CE became low enough there would be no variation in the tensile strength from the light sections to the heavy sections. From the graph, fig. 1, that would mean that the line would go straight across, parallel to the abscissa. While fig. 1 does not go that far, it does show a flattening out of the curve and a tendency to form a straight line. This is merely an interesting point, and does not mean that it can be obtained from an unalloyed gray iron.

One other point is shown in fig. 1 which is significant. After a section passes the 4-in. size there is not a great deal of variation in the physical properties of any particular iron and from the observations of others, it has been stated that after a section of approximately 13 in. has been reached, the physical properties are the same, regardless of the CE. This would be true for the center when the cooling rate might approach a constant, but not necessarily so for the outer edge. As will be shown, the outer edge is affected by the cooling rate of the center.

In fig. 2 the Brinell hardness is plotted against the section size. There is a striking, and expected, resemblance between these two graphs. It will be noticed that the curves begin with the ¼-in. section. It was not possible to satisfactorily pull this section in tension, hence no points were plotted for it in fig. 1. It might be well to point out again that all these irons were gray in all the sections including the ¼-in. sec-

tions and that these curves hold good only for unalloyed gray iron. If any had been mottled or white, the slope of the line would have changed very markedly in the section which was not gray.

Section sensitivity with regard to hardness, is more pronounced in the thinner sections that it is with regard to tensile strength. These curves apparently tend to approach infinity as the section is reduced toward zero. This is not practical because at some point the section will turn from whatever form of pearlite or gray iron it is, to a cementite or white iron, and then the hardness reaches a maximum. These curves do not show the expected variation in hardness from the edge to the center of the heavy section block. However, this difference will be shown later. The values plotted here were averages taken in the 2 to 6-in. sections. In the thinner sections, the specimens were ground down to get parallel surfaces and the reading taken.

Figs. 3 to 8 are a series of photomicrographs showing the change in structure of three classes of iron as the section size or cooling rate changes. The six photomicrographs in fig. 3 are of an iron with a 340 CE and were taken at 100X, unetched. It is very easy to see the changes in the graphite size and pattern as the cooling rate changes. In the 34-in. section, the pattern is quite dendritic and the graphite is very fine. In the 1-in. section the pattern is still dendritic but the graphite has become coarser. The 3-in. section still shows a dendritic pattern, but the graphite has coarsened up considerably. In the 4-in. section the

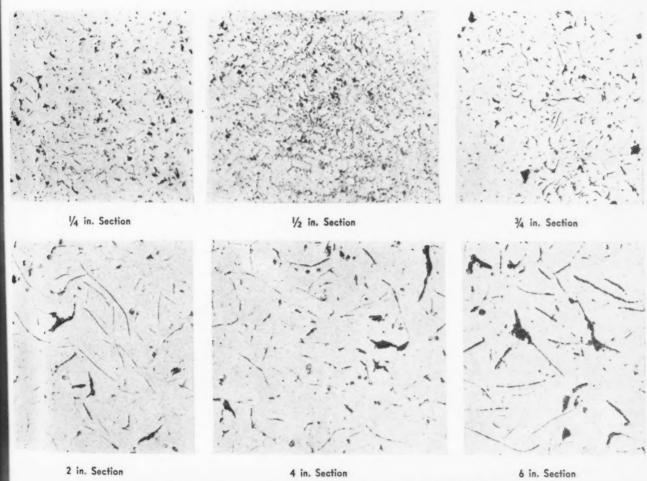
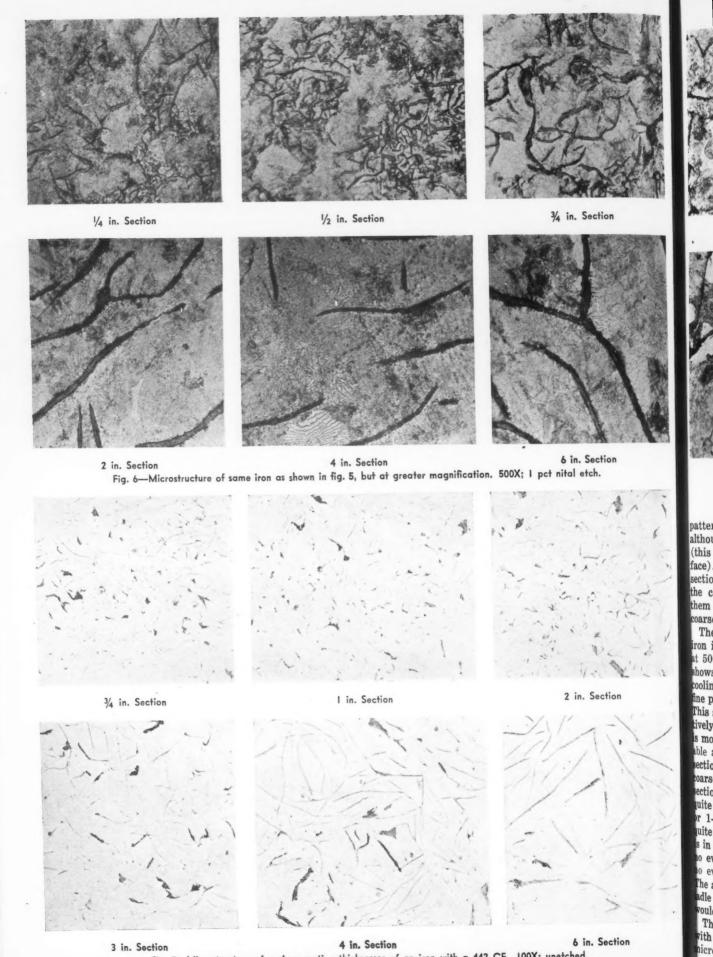


Fig. 5-Microstructure of various section thicknesses of an iron with a 395 CE, 100X; unetched.



4 in. Section 3 in. Section Fig. 7—Microstructure of various section thicknesses of an iron with a 442 CE. 100X; unetched.

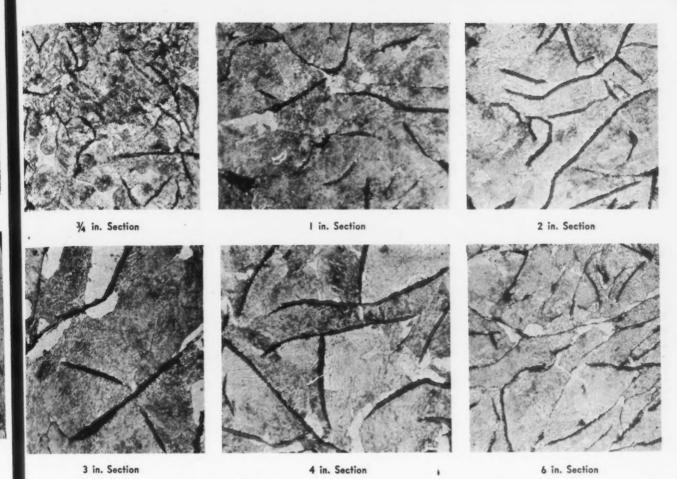


Fig. 8—Microstructure of the same iron as shown in fg. 7, but at greater magnification. 500X; I pct nital etch.

pattern is changing to the random type distribution, although there still are traces of a dendritic pattern (this micro was taken about an inch in from the surface). The last two micros are taken from the 6-in. section, the one from near the edge, the other from the center. There is very little difference between them except perhaps a little more space between the coarse flakes.

The six micrographs shown in fig. 4 are of the same ron in the same sections as in fig. 3, and were taken at 500X and etched in 1 pct nital. This illustration shows the change in the matrix as the section size or cooling rate changes. Ignoring the graphite, a very fine pearlite, much of it not even resolved, can be seen. This structure is indicative of high strength and relaively high hardness. In the 1-in. section the pearlite s more readily resolved but there still is a considerble amount of very fine pearlite. In the 3 and 4-in. ections it can be seen that the pearlite is somewhat parser but still very fine. The pearlite in the 6-in. ction is now readily resolved. The outer section is uite fine but nowhere near the fineness of the 34-in. r 1-in. sections. Although the pearlite remained uite fine throughout the sections, the greatest change s in the grain size. It should be noted that there is evidence of free ferrite in the heavy section and 0 evidence of free cementite in the light sections. he absence of free cementite can be attributed to the dle inoculation, without which the light sections ould be mottled or white.

The six micrographs of fig. 5 represent an iron with a CE of 395, 100X, unetched. The first two micros, showing the $\frac{1}{4}$ and $\frac{1}{2}$ -in. sections, are very

dendritic with extremely fine graphite. This form of graphite is the type not recommended for any wearing or machine tool application. The ¾-in. section shows the dendritic pattern still prevalent, but the graphite has become coarser. By the time the 2-in. section is reached, the dendritic pattern is gone and a random distribution has taken its place and the size of the graphite flakes has increased considerably. The 4 and 6-in. sections show very little difference both as to pattern and the size of the flakes. It is of interest to note that the dendritic pattern was eliminated between the ¾ and 2-in. section while in the 340 CE it existed into the 3-in. section.

Fig. 6 shows six photomicrographs of the 395 CE iron etched at 500X. These micrographs illustrate the change in the matrix as the section or cooling rate varied. The third class of iron, shown in fig. 7, is one with a CE of 442. These photomicrographs were taken at 100X, unetched. As the CE goes up the formation of the dendritic graphite is lessened, until, as in the ¾-in. section, there is little or none. Compare this to the micro of the 3-in. section of the 340 CE iron (fig. 4) and it will be seen that they are quite similar. The ½-in. section shows no more of the dendritic pattern than the ¾ in. In the 2, 3, 4, and 6-in. sections, the pattern becomes more and more random and the size of the flakes becomes larger.

Fig. 8 is a group of six micros of the 442 CE iron shown in fig. 7, but at 500X, etched in 1 pct nital. Probably the most interesting aspect of this illustration is the evidence of considerable free ferrite in a section as thin as 3/4 in. Contrast this to the 395 CE iron (fig. 6) where the ferrite did not show up until

the 6-in. section. As in the previous micros the pearlite is quite fine in the light sections and becomes coarser in the heavy sections.

Fig. 9 shows the relation between the tensile strength and carbon equivalent with the section size or cooling rate remaining constant. Taking the section sizes in order, it can be seen that tensile strength drops from 55,000 to 30,000 psi in the 1/2-in. section. This covers the range of 340 to 440 CE. As the section increases the line moves down and changes slightly in slope. After the section passes the 2-in. size the drop in tensile strength is not so marked. On this graph the cross hatched band represents the tensile

strengths of 1.25-in. bars cut from the outer portion of the 3, 4, and 6-in. test blocks. These results were so close it was decided to incorporate them into one range of values. An interesting point to note is that at about the eutectic value the curve flattens out in the heavy section. This curve would gradually go down and finally level off when the section became all ferrite and coarse graphite.

The bottom curve on this chart is plotted from values obtained from the center 6-in. test blocks. Here

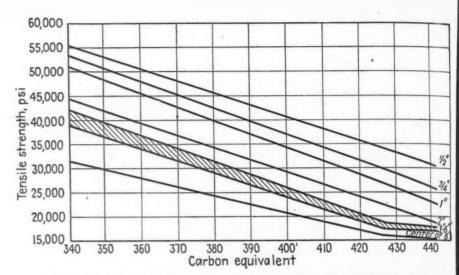


Fig. 9—Relationship of tensile strength and CE with cooling rate remaining constant.

again it can be seen that the curve flattens out at about the eutectic value. The slope of the line has decreased and is approaching the horizontal. If the section increased still more, it is reasonable to expect an approximately horizontal line on bars taken from the center of the blocks.

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The authors will continue this discussion in the second part of this article to be published next week.

Advantages of the Duplexing Process

ORMAL duplexing combinations are acid bessemer-basic open-hearth and basic bessemerbasic open-hearth, depending on the phosphorus content of the iron. Other combinations are: Bessemerarc furnace, open hearth - high-frequency furnace. When manufacturing normal commercial qualities of steel and using irons containing less than 0.4 pct P, the acid bessemer-basic openhearth is the best method, Norman F. Duffy writes in Iron & Steel, September, 1946.

The acid bessemer can be used in conjunction with the basic openhearth in three ways. The first and probably the best method is to use fully blown metal, adjusting the carbon content of the bath by additions of iron. A second variant is to blow all the iron to 1.0 pct C while a third method is to use fully blown metal followed by a "kicker" ladle of metal blown down to about 2 pct C.

Using the first method the iron is blown down to between 0.1 and 0.2 pct C, utilizing the photocell to control temperature and carbon. Steam injections or scrap can be used for cooling though iron ore additions are preferable if the plant can be designed to handle the large quantities involved.

In the second method metal blown to 1.0 pct C forms 80 pct of the charge, the rest being miscellaneous scrap. The blowing time for 25 tons is only 12 min using a blast pressure of 25 psi and supplying air at a rate of 30,000 cu ft per min. The charging procedure and amount of fluxes added are the same as in the method previously described except that no iron is

used, the blown metal following immediately after the scrap. A semi-solid, popcorn type of slag ensures that none enters the open-hearth furnace when the metal is poured at a temperature of 2732° to 2822° F. In spite of turning down at such a high carbon content, the lining is ready for replacement before the "kidneys" are large enough to hinder efficient operation. i.e. after 60,000 to 80,000 tons.

Using the third method and making a 0.10 to 0.15 pct C steel most of the time, 100 tons are left in the furnace after pouring a similar amount. Four thousand pounds of lime and 6000 lb of scale are added followed by 75 tons of metal blown to 0.06 pct C. A further 4000 lb of lime are charged and then a "kicker" ladle of metal blown to 2 pct C. This brings on the boil and the furnace is tilted slightly to allow the slag to run off. The heat is finished normally, usually after the addition of a further 2000 lb of lime.

It is often said that duplexed steel is over-oxidized and this criticism is to a certain extent true. The duplex process, with its high rates of reaction, naturally leads to a high percentage of dissolved iron oxide for a given carbon content. However, with correct deoxidation practice, the finished product is equal in quality to any basic steel.

The duplex process has many advantages, especially when the price of heavy melting scrap is high, and the capital outlay on a tons per hour basis is relatively low. Fuel consumption is approximately half that of the scrap-hot metal process, overall maintenance and refractory costs are also below normal.

New Equipment...

Testing and Measuring Instruments

Newest developments in testing and measuring instruments and laboratory equipment discussed in this week's issue, include temperature controllers and recorders, pyrometers, circuit testers, dewpoint indicators, an X-ray photometer, and a spectrographic calculator.

ADAPTABLE to many processes involving the control of temperature and pressure in the manufacture of rubber, plastics, chemicals and textiles is an automatic recorder-controller, announced by the C. H. Tagliabue Div. of Portable Products Corp., 590 Park Ave., Brooklyn 5. This instrument requires only the push of a button to

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control processing from start to finish. By use of an adjustable cam, timing starts automatically when the temperature reaches the processing point and is terminated at the desired moment. All valves, whether steam, air, water or overflow, are opened and closed as the process may require without manual attention of any kind. A red light glows during the steam-heating phase of the process. When leating has been completed and steam has been shut off, the red light is extinguished and a white ight appears. This goes out after sufficient time for cooling has elapsed.

Temperature Regulator

ALLED the Mercuroplat Thermoregulator, a mercury emperature regulator with red or white signal light which glows while temperature is rising and huts off when setting temperature is reached, has been developed by the Washington Glass Laboratory &

Instrument Co., 3224 Georgia Ave., N.W., Washington 11, D. C. The signal light can be seen at a distance when glowing, permitting the operator performing other duties to determine at a glance when temperature in bath, oven, etc., has reached setting temperature and when regulator is operating properly. The regulator is intended for accurate control of temperatures in water, oil, or air baths, ovens, etc., at any temperature within the setting range from -30° F to $+500^{\circ}$ F. It is said to have a sensitivity of ±0.20°F or better. The Thermoregulator is available in 6, 8, 10, or 12-in. lengths.

Portable Pyrometer

ALNOR type 1500, a compact, lightweight pyrometer mounted in a magnetically shielded metal case has been designed by the Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10, for temperature readings in shop as well as laboratory. The pyrometer movement is the Alnor double air gap type, with Alnico magnet. The case is heavy gage sheet steel, providing magnetic shielding so that the instrument may be used on



steel top tables, near other magnetic instruments, or in strong alternating fields, without affecting its accuracy. Type 1500 is available as a single circuit pyrometer with a choice of 10 scale ranges, 0°-400°

to 0°-3000°F, or Centigrade equivalents, and as a double or triple range instrument built to order with scales as specified.

Temperature Meter

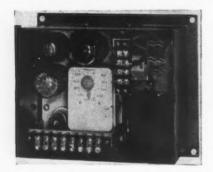
AN electronic potentiometer-pyrometer which has no continuously moving or vibrating parts in its measuring circuit has been announced by *Bailey Meter Co.*, 1050 Ivanhoe Rd., Cleveland 10. It records one or two tempera-



tures on a 12-in. diam uniformly graduated chart and indicates on a 29-in. bold scale which encircles the recording chart. This indicating, recording and controlling instrument requires a 115 v, 60 or 50 cycle, ac power supply. It operates from a thermocouple or from any source of dc potential which varies through at least 10 millivolts for full scale range. Conventional thermocouples are used for temperatures up to 3000°F and radiation type thermocouples are used for temperatures above 3000°F and for moving objects above 1500°F. The potentiometer circuit employs a dc to ac converter and an electronicdetector, to measure potentiometer unbalance. The pyrometer may be furnished with two controllers operating from two separate measuring circuits all housed in the same recorder casing.

Thermal Protector

FOR protection from excessive temperature in air ducts on industrial ovens, dryers, bearings of large motors, blower wheels, flue gas stacks of boilers, plastic injection presses, reheaters, etc., a thermocouple actuated limit switch, known as the Ashcroft thermal protector has been produced by Manning, Maxwell & Moore, Inc., Bridgeport, Conn. The temperature chosen as the high limit is set by an operating knob located inside the case. If this temperature is reached, the device will stop the apparatus before excessive damage is done, or it can be arranged to sound an alarm or light a light. In addition, the device provides protection in case of burning off or breaking of thermocouple, failure of power supply, tube or mercury



switch. The protector is designed with two ranges, 100° to 1000°F and 800° to 2000°F, with an accuracy of 2 pct, it is said, of the range at a set point.

Pyrometer Controller

K NOWN as the Multronic Capacitrol, a multi-position electronic pyrometer controller has been developed by the Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, to meet applications requiring instantaneous, accurate indication and control of temperature, voltage, current, signaling and similar variables in process industries. The instrument provides conventional on-off control at one or two different points, control of two separate fuel systems on a single pot or other heat-treating type furnace, automatic positioning control for electric, oil and gasfired equipment. On-off control plus automatic fuel shut-off or multisignaling at two points or two signals at dual points can also be controlled with the Capacitrol. Two electronic control circuits operate in harmony with each other, but independently, to control the variables as measured by an indicator, providing instantaneous action.

Surface Pyrometer

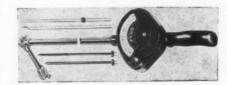
QUITED to metallic or nonmetallic surface temperature problems, a surface pyrometer which is



selfcontained, portable, compact and quick acting has been announced by the Pyrometer Instrument Co., 103 Lafayette St., New York 13. Constructed in a shock, moisture and dustproof shielded steel housing, it is said to be immune to external magnetic influences. A large 43/4-in. diam indicator with a 4-in. direct reading scale offers ease in reading temperatures. An internal automatic cold and junction compensator is standard equipment. The instrument features eight different types of thermocouples, and two types of extension arms, all interchangeable without adjustment or recalibration together with five temperature ranges from 0°-300°F to 0°-1200°F.

Immersion Pyrometers

ESIGN features of an immersion pyrometer developed especially for the nonferrous industry, by the Pyrometer Instrument Co., 103 Lafayette St., New York 13, include a 43/4-in. indicator with a 4-in. direct reading scale calibrated for 0° to 1500°F or 0° to 2500°F or equivalent Centigrade. Two models with overall lengths of 27 in. and 43 in. are manufactured both having a special swivel 8 in. from the connector block which permits the use of the pyrometer at



any angle. The swivel is equipped with toothed notches preventing it from becoming loose during operation. This instrument can be used with bare metal and protected type

interchangeable thermocouples. The thermo-electric system is constructed with a permanent magnet, low resistance type galvanometer, has an internal automatic cold end compensator in addition to an external adjusting screw and is enclosed in a shock, moisture and dustproof steel case. This housing is said to assure protection from possible demagnetization or interference from magnetic surroundings.

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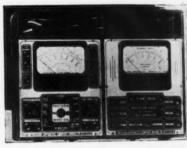
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Circuit Tester

ESIGNED for use in industrial, electric power, laboratory testing and analysis, a multirange ac-dc industrial circuit tester, series 856-J, has been announced by the Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y. The 856-J is a unit combination of the precision



series 856 and series J, providing wide selection of 52 ac-dc voltage and current ranges. The ac current unit incorporates an internal heavy-duty current transformer designed for operation on 25 cycles and higher. Two 41/2-in. full-vision meters are provided. The 856 meter has 50 m amp full scale sensitivity and provides calibration at both 20,000 and 1000 ohms-per-volt. Series 856-J affords the added advantage of making possible simultaneous measurements of ac current and voltage with independent readings on the separate meter dials. Overall size of the equipment is 11 x 15 x 6 in.

Resistance Tester

7ITH a test range of 0 to 100 megohms, an instrument for checking insulation resistance in ac and dc equipment has been announced by Ideal Industries, Inc., 1925 Park Ave., Sycamore, Ill. The tester is selfcontained, powered by a small internal hand generator which is operated by a slowly turning crank. Correct testing voltage is indicated by two button lights that glow at 500 v dc. When the crank, which operates in either direction, is turned faster than necessary an electronic voltage regulator controls the voltage to the meter so that a true reading is obtained. Test leads are 10 ft long and overall dimensions of the tester are 33% x 6 x 31/4 in.

Resistance Meter

ANNOUNCEMENT of a portable selfcontain resistance meter, testing to 50,000



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megohms, has been announced by Associated Research, Inc., 231 S. Green St., Chicago 7. The testing unit, Model 261 Vibrotest, provides positive and definite reading of true resistance to this wide range, it is said. A hand-stepped scale, calibrated against known standards of resistance insure accuracy. The meter has a high voltage regulator in the measuring circuit and is equipped with condenser charging circuit to facilitate faster testing of condensers or capacity circuits. Cranking has been eliminated in this unit. It has its own power supply in two No. 6, 11/2-v dry cells which provide power of 500 v. The meter is tested and checked for extremes of temperature variations. high and low, from -40° to +140°F.

Multirange Tester

PRODUCTION of a 41-range, panel mount, ac-dc laboratory circuit tester, incorporating a 9-in. rectangular, 5000 ohms per volt me-



ter, has been announced by Precision Apparatus, Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y. This instrument, designated as series 864, has been designed for use in the modern electronic laboratory for radio receiver and transmitter service, industrial maintenance and production testing. It provides the functions of an ac-dc voltmeter, ohmmeter, milliammeter, ammeter and decibel meter. It is housed in a standard 121/4 x 19-in. panel and is designed for standard relay rack mounting. The separately enclosed remote control range selector unit slides out of its panel compartment for bench operation. A selection of ranges is provided up to 6000 v ac and dc; 20 megohms, 12 amp, 70 db.

Dewpoint Recorder

DESIGNED for applications where the moisture content of atmospheres and gases must be measured or controlled, such as in checking furnace atmospheres, testing city gas, or determining the humidity of gases used in factory production processes, a dewpoint recorder which can determine automatically and continuously the amount of moisture, has been announced by the General Electric Co., Schenectady 5. The recorder is a combination of heater, refrigerator, mirror and gas chamber. The test gas enters the gas chamber and comes in contact with a metal mirror which is cooled or heated by the refrigerator or heater until a temperature is attained at which moisture in the gas forms dew on the mirror. A photoelectric eye watches the mirror and the mirror temperature is recorded on a graph or chart the moment dew forms. Working in coordination, the refrigerator and heater hold this dewpoint temperature within a tolerance of 2° so that a continuous reading on the chart is achieved. The dewpoint temperature can then be converted into the moisture content of the gas if desired. The instrument is designed for operation at atmospheric pressure over a dewpoint range from ambient to -90° F.

Dewpoint Indicator

EWPOINT, relative humidity, grains moisture per pound, and latent heat of any noncorrosive gas can be determined with the Alnor dewpoint indicator, model 8, produced by the Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10. Indication takes place in an enclosed observation chamber under conditions which can be controlled and reproduced. Condensation takes place suspended in the air or gas sample and the end point or vanishing point may be accurately observed, reducing errors due to the human element, it is said, and permitting consistent determinations by two or more observers. This instrument is portable and does not require external



cooling means or auxiliary appara-The dewpoint indicator is tus. available in two ranges, for dew points between -20°F and room temperature, or from -100° to 0°F.

Flow Rate Instrument

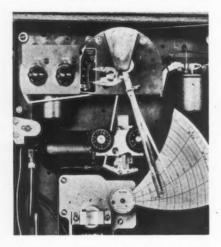
ROP-BY-DROP flow rates down to less than 5 milliliters of liquid per minute, and for gases to less than 25 millileters per min cannot only be measured but remotely and automatically recorded. controlled and totalized, it is said, with the Rota-Tronic instrument developed by the Fischer & Porter Co., Dept. 4M-4, Hatboro, Pa. This instrument when attached to Rotameters detects the Rotameter float position. The minute electric current is amplified to produce



power at the recorder pen. Flow rates encountered in laboratory or pilot plant operations as well as the small industrial flow rates such as of inhibitors and synthetic rubber mercaptan modifiers can be recorded, controlled and totalized with this instrument, it is said.

Process Adjuster

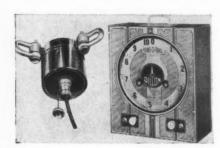
K NOWN as the Adjustable Indexet, an improved pneumatic receiver that multiplies, divides, adds and subtracts by means of span and zero adjustments has been designed by the Brown Instrument Co., 4496 Wayne Ave., Philadelphia 44. The span or proportional adjustment of 0 to 200 pct, permits a change between the span through which the instrument



control point is moved and the change in transmission pressure which moves the control point. Span dial is calibrated in terms of the distance in percent of full scale that the control index will move along the chart per full scale changes in pressure. Span is the multiplying and dividing adjustment. The zero, or linear, adjustment, -100 to +100, adds or subtracts a constant value. The zero dial is calibrated in terms of full scale and moves the zero position along the chart. Both span and zero shift can be adjusted without upsetting the control point.

Tension Indicator

CALLED the Tens-O-Trol, an electric remote tension and weight indicator has been an-



nounced by W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, providing repeater stations that

may be as far as 300 ft from the actual measuring dynamometer. The pressure beam in the Tens-O-Trol requires a deflection of only 0.040 in. to render a full scale 360° reading, it is said. This ultra-sensitive feature makes possible the determination of delicate load balance or unbalance and magnifies it. A complete Tens-O-Trol system consisting of a master transmitter and two repeater stations requires 12 v dc for operation. Extreme temperature changes are said to have no appreciable effect on the instrument. The unit does not depend upon springs or oil-filled mechanism and can take a 25 pct overload without injury to calibration.

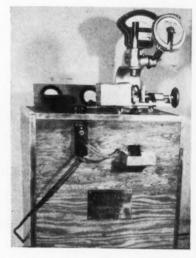
X-Ray Photometer

BY measuring the change in absorption of X rays between sample and a standard, an X-ray photometer, announced by the General Electric Co., Schenectady 5, indicates and records the concentration of one chemical element in the presence of others, in solids, liquids or gases. The photometer, nondestructive to most materials, can be used in such applications as determining the ash content of coal, sulfur content of oil, hydrocarbon, chlorine or fluorine content of plastics. The sensitivity of this method of analysis varies from 0.01 to 1.00 pct, depending upon the difference in atomic numbers of the components making up the specimens. The photometer is housed in a standard control cabinet, 72 in. high x 28 in. wide x 20 in. deep. All controls are available from the front of the cabinet. Provision is made for several types of test cells, in which the samples are contained, and the liquid and gas cells can be arranged for continuous flow of the materials being analyzed. The instrument features high speed of response and continuous operation. No special skill is required to operate the analyzer.

Metal Powder Press

DESIGNED for laboratory use in developing and producing special powdered metal alloys, a machine for hot pressing nonferrous metals and metal alloy powders has been developed by the National Diamond Hone & Wheel Co., 108 Fulton St., New York 7. With this press, which is known as the Strauss hot powder metal press, copper, tin, nickel and zinc in pow-

dered form can be alloyed and hot pressed under adjustable heat and pressure conditions to produce alloy metals having a wide range of applications. The press is especially adapted for use in the production of corrosion resistant metal of high density such as is often required in laboratory and production work. The laboratory model press, mounted on a small stand, weighs approximately 150 lb and mea-



sures 24 x 24 x 36 in. Resistance heating of the carbon die is accomplished by connecting the heating unit to a 115-v ac circuit.

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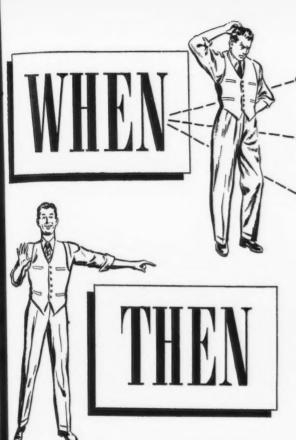
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Drum Type Calculator

SPECTROGRAPHIC an alysis can be accelerated, it is said, by calculating the composition with a series of working scales found on the Dunn Lowry drum calculator manufactured by the Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4. The calculator as shown consists of a board for plotting curves and a large rotary drum which carries the analytical scales. The board portion of the calculator is used in much the same way as other boards, while the relative intensity is determined or measured



by means of a movable horizontal logarithmic scale at the bottom. The 2-cycle scale, 12-in. per cycle, is 24 in. long. Seventy-two scales are provided.



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YOUR BASIC HEAT TREATMENTS CALL FOR
 CHEAP LARGE-VOLUME ATMOSPHERE GENERATION

• YET . . . OCCASIONAL HIGH-CARBON WORK WOULD

BE SENSITIVE TO CO₂ OR H₂O

AND . . . SPECIAL CARBURIZING JOBS DEMAND ENRICHED ATMOSPHERES

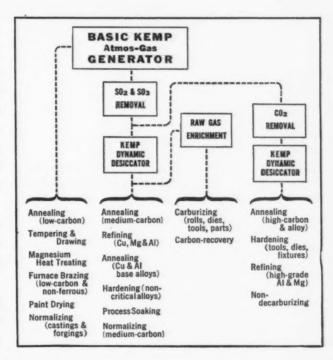
one central KEMP generator can serve all three needs

THAT'S because the basic KEMP atmosphere gas can now be modified for (1) complete desiccation, (2) complete CO₂ removal, (3) sulfur scrubbing, (4) odor removal, or (5) raw gas enrichment—any, or all, in any combination.

Thus, you can install one central atmosphere generator—fully automatic, of course—and tap off fractions of its output for special modifications to suit special needs.

The basic atmos-gas costs you only 8 to 20¢ per mcf (fuel, power, maintenance and depreciation)—the modifications, where you need them, a dime or so more.

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 Many producers are considering production cuts... Stamping plants hit hard by steel shortages... Automobile personnel is top heavy.



ETROIT—The situation confronting many automobile producers and their suppliers at the moment is something like this: inventories of many items are dwindling to dangerously low levels. In many categories there are strong indications that production schedules cannot be matched with the present flow of materials. Moreover, every time an assembly line goes down, hundreds of workers disappear and are never heard from again. All of which contributes to high labor turnover, increased production costs and uncertain production by newly trained hands.

The \$64 question for the automobile industry is whether production schedules should be cut now or management should continue to struggle along on a hand-to-mouth basis and, if this fails, risk a complete shutdown of the plant.

To adopt the former course means laying off relatively few men now but offers some assurance of continued employment for those fortunate enough to remain on the payroll. Adoption of this course will also mean somewhat less pressure on suppliers and a less harried time for management at the cost of substantially reduced profits.

ON the other hand, by attempting to maintain production at levels higher than the regular flow of materials can sustain, hand-to-

mouth high pressure operation is inevitable. An abrupt plant shutdown has also to be faced. When this happens, profits will nose dive and workers will vanish by the thousands. Moreover, if the same thing occurs simultaneously in a number of plants, the resulting break in production may even toss the entire industry into a tailspin.

Few automobile producers or their suppliers are entirely free from making such a decision-and soon. Several producers have already reduced operations. Others including GM and Ford are making plans to cut their schedules and their decisions are likely to be made within a few weeks. Other segments of the industry are apparently determined to cling doggedly to present production rates, hoping against hope that the flow of materials and the demand for their product will justify production at the present rate.

During the past week the spotlight has been turned on steel and there is little inclination to conceal the pessimistic view the industry is taking with respect to future steel deliveries. In a memorandum prepared by the Automobile Manufacturers Assn. this week the unfavorable factors set forth far outweighed any favorable aspects of the situation.

It is recognized, the bulletin said, that many mills are required to clean up a substantial number of allocations between now and the end of the year but that every effort is being made by the steel industry to do this without upsetting deliveries to regular customers.

The bulletin also pointed out that in addition to strikes and their after-effects, the steel industry was experiencing long delays in deliveries of rolling equipment resulting from the prolonged GE and Westinghouse strikes last spring. The critical labor situation in the steel industry and difficulties encountered in hitting production schedules in the mills were also emphasized. Mentioned as minor factors now, although factors that may assume considerable importance in the future, were the threat of rail-

road car shortages and the scrap supply problem.

The experience of one large supplier of automobile parts is typical of what is happening to a number of large stamping plants.

Following VJ-Day an ambitious production program was drawn up. Operations were planned on a 3-shift basis. New plant facilities were acquired and considerable new tooling was installed.

THE first blow came when a large inventory of steel sheets had to be turned back to the government in complying with disposal regulations. Some inventory was accumulated during the reconversion period although supplies of cold rolled on hand never reached pre-war levels.

Since the turn of the year, the application of quotas and inability to locate new steel suppliers prevented any further accumulation of steel inventories. The entire output of one substantial supplier was diverted to tinplate on government order. As automobile production schedules were raised it became necessary to dip further into inventories already considered to be inadequate.

Because of low inventories it was possible to make only short runs of parts. Dies had to be pulled frequently to utilize the steel that was available. Factory float, although large, was poorly balanced, making it difficult to meet commitments. Uncompleted components accumulated. Plant workers, observing the supply difficulties, walked off the job in droves sending labor turnover to a record high.

THIS week, with only a few days' supply of steel on hand, this particular producer must choose whether to operate for 2 weeks at present schedules and then close the plant or cut production to 1-shift operation and hope to avoid a complete plant shutdown.

Drills,

sitive

While steel is the most critical item at this stamping plant at the moment, supplies of other materials—particularly lead—are down to dangerously low levels.

NO JIGS NEEDED

for drilling, boring, reaming and tapping

NEW Bullard MAN-AU-TROL Spacer Increases Speed and Reduces Cost of Drilling Operations

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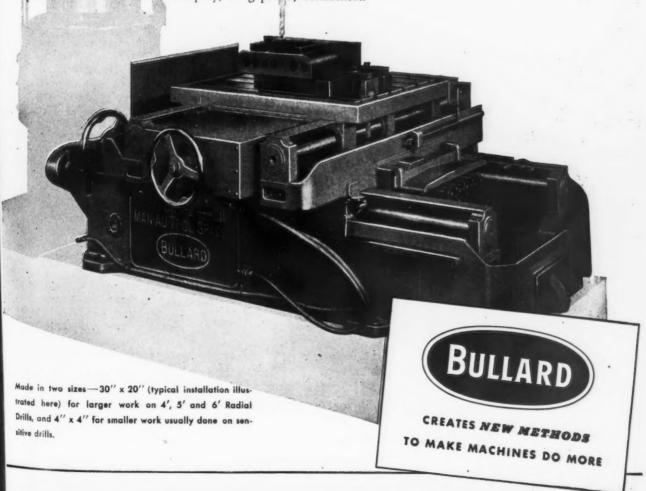
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at the ateriwn to Now . . . with Bullard MAN-AU-TROL Spacers installed on your drills . . . you can start drilling, boring, reaming or tapping just as soon as your engineering drawings are ready.

Working from a master chart, the operator quickly, easily and accurately sets lateral and longitudinal position stops to match the specified pattern of holes. Then, the manually activated Spacer automatically repeats that pattern so that the holes are held to the highest standard of commercial spacing accuracy. Easy change-over from job to job and adaptability to an endless variety of work sizes and shapes makes the Spacer ideal for diversified shop schedules.

Consider the time, money and labor you will save when Bullard MAN-AU-TROL Spacers eliminate the need for designing, making, handling, repairing and storing hole-locating jigs. Write for MAN-AU-TROL Spacer Bulletin. The Bullard Company, Bridgeport 2, Connecticut.



The steel difficulties Ford is experiencing have been well publicized during the past week. Although the majority of Ford steel is produced at the Rouge, Ford operations were interrupted this week because of the steel shortage. Ford's troubles began nearly two months ago when one of two blast furnaces went down and remained out for nearly two months. A strike in the Ford openhearth department which Ford has described as an effort by "subversive factions" to dominate the union is well along in its second week with prospects for a settlement so dim that Henry Ford II has called upon Phillip Murray, national president of CIO to intervene.

Prior to its blast furnace and labor troubles Ford had succeeded in jacking up sheet steel production at the Rouge to the highest level in the history of the company. This was accomplished by converting all cold-rolled bar mills to sheet and making use of government-owned annealing facilities at the Rouge which were employed during the war to anneal steel castings.

ETTING back to the basic economic difficulties confronting the automobile industry these days, automobile, body and parts plants are paying out nearly \$36 million weekly to 699,000 hourly-paid workers, an increase of 76 pct and 25 pct respectively over 1941.

Meanwhile, production of automobiles and trucks amounts to 1,-621,816 for the first eight months of 1946 or less than half of the 1941 totals when 3,587,745 units were produced during a comparable period.

Salaried employees in engineering, purchasing and other departments are substantially greater than in 1941, since considerably more personnel is needed to combat materials and parts shortages and keep up with paper work requirements.

One producer is currently employing 18,000 more salaried employees than in 1941. Another has more than doubled its monthly rolls. Purchasing departments are more accurately described as expediters and salesmen than as materials buyers.

What worries many people in the industry today is the question of how much of a cut in production the industry can take without tipping over its top-heavy personnel.

U.S. Ratio of Persons Per Vehicle Is 4.5

Detroit

• • • Three out of every four passenger cars and trucks serving 184 countries, possessions and territories throughout the globe are registered in the United States.

The U. S. ratio of persons per vehicle is 4.5 compared with a vehicle for every six people in New Zealand and a car for every eight persons in Canada and Australia. Far down the list are India with one car for every 3099 people and Liberia which has only one automobile for every 5300 inhabitants.

According to the Automobile Manufacturers Assn. world registration of passenger cars, trucks and buses is 42 million of which 31 million are registered in the United States.

Although second to the United States in total motor registration, the United Kingdom has only 2,200,000 vehicles. France has 1.5 million and Canada about the same number.

The latest report on the Soviet Republic in 1941 showed 1.06 million motor vehicles registered, but this total has undoubtedly been increased by American lend-lease cars as well as Russian vehicle production.

WAA Plans Campaign To Spur Foreign Sales

Washington

• • • An attempt to promote sales of surplus property to foreign purchasers through advertising in foreign-circulated American trade journals printed in Spanish and Portuguese has been revealed by WAA. All surplus items except those on the critical list for priority holders will be made available for foreign markets.

Export divisions have been established in 11 regional WAA offices although purchases may be made at any regional office. Export divisions are established at Boston, New York, Philadelphia, Detroit, Chicago, Seattle, San Francisco, Los Angeles, New Orleans, San Antonio and Houston. An export division is also to be found in the Miami district office.

Buick Leases Huge Tank Arsenal for Warehouse

Flint, Mich.

• • • The 1200 ft long wartime tank arsenal facing Dixie highway at Grand Blanc, Mich., is being turned into a huge parts warehouse and shipping depot by the Buick Motor Div. of General Motors. The new parts warehouse is big enough to store more than 10 million lb of spare parts including engines, transmissions and large body stampings as well as the tiniest engine parts. More than 500,000 sq ft of floor space are available for storage and shipping.

Leasing of the governmentowned tank plant at Grand Blanc
marks an important forward step
in Buick's postwar expansion and
modernization program, according
to Harlow H. Curtice, Buick general manager and vice-president
of General Motors. Transfer of
parts and service operations to
Grand Blanc, he explained, will
release space for manufacturing
in Flint and provide new quarters for Buick's engineering department.

More than 700 workers will be employed in the new parts warehouse. Parts entering the plant are inspected and packaged and may be moved by power conveyors and electrically-driven trucks to storage bins and packing and shipping areas of the plant. A new loading dock is 60 ft wide 120 ft long and can load 12 truck-trailers and seven railroad cars simultaneously.

Truck Registrations High

• • • New truck registrations in excess of 60,000 units for the month of August were predicted by R. L. Polk & Co., statisticians for the automotive industry who reported that 37,154 new trucks were registered in 35 states tabulated up to the present time. Polk registrations are currently higher than the best prewar months although the total for the year will not surpass 1941 because of the late start and interruptions in production.

Based on preliminary returns new car registrations for the month of August are expected to reach 175,000 units which compares with 155,545 for July from 48 states.



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It's now being used for both alkaline and acid solutions. It's interchangeable with other older Udylite barrels and will stand up under extremely severe service with a negligible amount of maintenance.

It might be hard to believe all these things of this new barrel if they had not been proved in actual service and just as stated.

Now when you need additional plating barrels do not fail to have a look at the new Udylite Melamine Barrel.

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Washington . . . L. W. MOFFETT

• Trade conference in London to consider code for world commerce... State Dept. charter proposes widespread tariff and other changes.



ASHINGTON—A committee of 19 nations is gathering in London this month for the purpose of planning a world trade conference to be held next year. Duties of the committee not only consist of making arrangements for the meeting, but include the drawing up of a tentative charter for the International Trade Organization which is expected to emanate from the 1947 conference.

Surprisingly enough, for once the United States seems to have gotten off to a head start in one of its numerous dickers with other countries. In advance of the committee meeting, the State Dept. has drafted a suggested charter for the proposed ITO and it has not only submitted it to the United Nations, but has transmitted copies to all countries with which the United States maintains diplomatic relations. Thus, it is the first country to come forward with a complete plan for ironing out trade differences between nations.

This is as it should be inasmuch as the United States originated the idea of establishing a common code for governing world commerce. The first suggestion was made in December 1945, and in February 1946 a United Nations committee passed a resolution calling for a world conference and naming a committee to meet this fall to make the arrangements and to draft a charter.

The State Dept. has now handed it a made-to-order outline.

HANCES are that the charter suggested by the United States will be revised and modified in order to meet the needs and objections of other nations. None of the nations are committed to support it as outlined, although both England and France endorsed the original proposals on which the suggested charter is based and the remaining 16 nations have expressed themselves as agreed to it in principle. Its prime importance at present is the fact that it affords a concrete framework on which to build.

Briefly, the 20,000-word document put forth by the State Dept. offers a set of basic rules for governing trade barriers, restrictive business practices by both government and private interests and the international aspects of domestic employment policies.

In general, it frowns upon all restrictive trade practices including, by implication, the preferential trade tariffs which are granted by both the United States and Great Britain. This nation has such arrangements with Cuba and will have others with the new Phillipine Government; the British countries have a more extensive system of preference among themselves under the 1932 Ottawa agreements.

Obviously, the effect of such agreements is to channel trade between the participating countries to the more or less exclusion of other nations. Regardless of whether it is more or less, which depends on the amount of margin between the preferential and regular rate, in effect, the whole deal is discriminatory.

M ost of these preferential systems are outgrowths of disordered or abnormal conditions which exist or have existed within the countries which practice them. The State Dept. believes that it is now high time to do away with preferences if the proposed ITO is to be more than just a name. In this respect, Clair Wilcox, director

of State Dept. international trade policies, says:

"It (discrimination) obstructs the expansion of trade, distorts normal relationships and prevents the most desirable division of labor, tends to perpetuate itself by canalizing trade and establishing vested interests and shifts the emphasis in commercial relations from economics to politics."

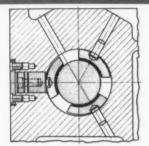
While not demanding that preferential tariffs be dropped from the book outright, the charter recognizes their existence and asks that participating countries join in bringing about their reduction and, if possible, their final abolishment. It is pointed out by Mr. Wilcox, however, that the suggested charter does not seek establishment of free trade.

"Free trade would require complete elimination of protective barriers," he declares. "Politically, this would be impossible; economically, it would be unwise. As far as this government is concerned, its negotiations with respect to specific barriers to trade will be conducted within the limits of the authority conferred upon the President by the Reciprocal Trade Agreement. It cannot take it all the way to free trade. We expect to come out of the impending conferences with something far better than the sort of restrictionism that has fastened itself upon the world's commerce during the last 20 yr."

The suggested charter hits specifically at private combines and cartels through which various interests band together to fix common selling prices, to curtail production, to boycott outsiders and otherwise restrict competition and fair trade. Admitting that in some fields this has not happened, the State Deptemphasizes that in others it is normally a common practice.

It is quite clear that goods can surmount a tariff if they pay the duty; they can enter despite a quota if they are within it. If a private agreement divides the world's markets between cartel members, however, it is equally as clear that goods cannot move between such zones while such a contract is in force. It is the State Dept's. con-





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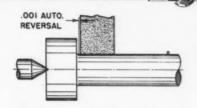
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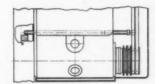
FILMATIC SPINDLE BEARINGS. Selfadjusting shoes produce independent, converging oil films which develop high radial pressures, forcing grinding wheel spindle into central position and keeping it there. No down time is ever charged against FILMATIC bearings.



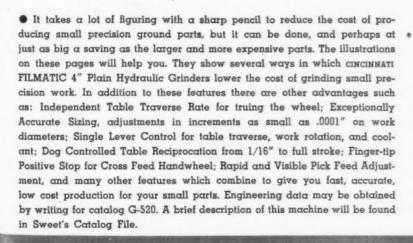
Chart above illustrates distance table travels in ten revolutions of handwheel. Slow speed for grinding shoulders; high speed for setting up is ten times faster.



Accurate table reversal within .001", an important feature when grinding next to shoulders; reduces spoilage.



Two-speed grinding wheel drive has double diameter V-belt sheaves to provide increased wheel speed for worn wheels; increases wheel life,

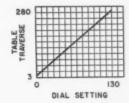




Kneehole in the new FILMATIC 4" Plain Hydraulic permits operation of the machine while the operator is seated comfortably on a chair or stool.



Ample and effective coolant guards are shown in this rear view of the machine. Motors are protected from dust and moisture, minimizing electrical maintenance.



Infinitely variable table traverse speeds — hydraulically powered, 3" to 280" per minute—the right speed for every job, including wheel truing.

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CENTER TYPE GRINDING MACHINES . CENTERLESS GRINDING MACHINES . CENTERLESS LAPPING MACHINES

tention that if the governments are to lighten restrictions, they must also make sure that private agreements do not undo the work they have accomplished.

SPECIFICALLY, under the suggested charter it is proposed that the countries act, individually and collectively, to curb international trade cartel practices which tend to interfere with the free flow of trade, increased production, or access to markets and raw materials. It is proposed that a special agency be set up within the ITO to receive complaints, to obtain and determine the facts and to advise the organizations as to remedies required and recommended.

Necessarily, the question of enforcement against private violators will be up to the individual government. It will be a function of the ITO to recommend action, however, under the laws or procedures of the country. In the case of the United States, proceedings against violations presumably would consist of prosecution under the antitrust laws.

The suggested charter goes deeply into the subject of non-discrimininatory treatment. It

recognizes the great growth and progress of nationalization in many countries during the war. While the State Dept. frankly doesn't like this course of events, it accepts the fact that there is little that it can do about it and that it may just as well face the facts of life and settle trade differences in an amicable manner. It is obvious that if Russia and satellite nations over which she exercises control are not to be automatically eliminated from the ITO, state trading must be allowed.

E do not wish to isolate ourselves from the collectivist economies, to divide the world into public-trading and privatetrading blocs," the State Dept. explains. "Nor do we believe that the forms and methods of collectivism should be employed in carrying on the whole of the world's trade simply because they provide the most convenient method of dealing with the small fraction of trade that is in public hands. The solution must be found in an arrangement which will enable free market economies and controlled economies to trade with one another on a basis of equal treatment and mutual advantage."

Subsidies, practiced by most

countries and which in recent years have enjoyed an abnormal growth within the United States, are discussed. These are not condemned in general in the proposed charter although export subsidies are recommended for elimination within 3 yr. It is suggested, rather, that subsidies which injure world trade be reported to the ITO for study.

There is little that is new in the suggested charter. Its principles may be found in our commercial treaties, reciprocal trade agreements, the "Atlantic Charter," mutual-aid agreements during the war, lend-lease settlements, credit extension to other nations, and so on. But it is unusual that this country should take a firm stand in trying to get other nations to agree to and adhere to the same policies. The real test would seem to be in finding out how far other governments will go in forming such a partnership and to what extent they will carry out their part of such agreements.

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WAA Offers Surplus Heat-Treating Items

Washington

• • • WAA is offering approximately \$4,600,000 worth (acquisition cost) of induction heating and heat-treating equipment for sale. The offering includes 243 industrial furnaces, of which 188 are 9600 cycles, 1, 2 or 3-station 220/440 v, 3-phase, 60 cycle, ranging from 7½ to 125-kw, and 55 are 200-kw machines at 3000 cycles. They are offered on a fixed price basis determined by condition of the equipment. Most of the equipment has been used, although some is in new condition.

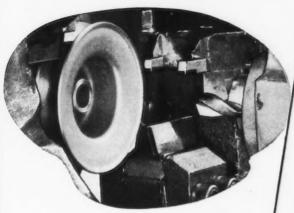
During the war, this equipment was used in the heat-treatment of shells, bombs, propeller blades, cartridge cases and many other similar types of war material. Its civilian uses include forming and forging metal parts for industrial machines and production equipment by hardening, brazing, annealing and heating.

The equipment is located in the following WAA Regional Offices: Atlanta; Birmingham; Boston; Charlotte, N. C.; Chicago; Cincinnati; Cleveland; Dallas; Denver; Detroit; Houston; Kansas City; Los Angeles; Louisville; New York; Philadelphia; Richmond, Va.; St. Louis; Seattle, and Tulsa, Okla.

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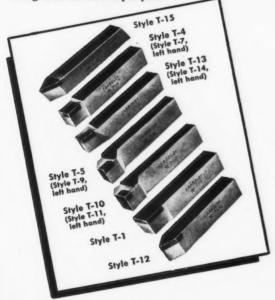
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4 Stations on Turret Eliminated—19 Tools Saved! By tooling up with Carboloy Cemented Carbide "Standards", 4 turret stations were eliminated, 19 tools saved. Savings like this, month after month, add up to big cost-reductions per year.





80% of Hand-Polishing Eliminated! High surface finish obtained in mass-production machining of this steel gear made possible cutting hand-polishing time 80%.

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A change to Carboloy Cemented Carbide "Standards" is a change to increased production, better finish, lower cost. Available in 11 Standard Styles—adaptable to 60%-80% of the turning, facing and boring jobs, they are actually priced lower than ordinary tools in many sizes.

For a useful guide to most efficient use of "Standards", grades, prices, specifications, etc., write today for Catalog GT-175R.

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• Battle for more steel for West Coast goes on with no evidence of success . . . AISC convention to draw more than 500 members to Coronado.



SAN FRANCISCO — Convinced that their only hope lies in adoption of the policy of "the squeaking wheel gets the most grease" steel fabricators of this area are continuing their barrage of political pressure at Federal Government heads in an effort to relieve the critical shortage of steel.

The recent explanation of the situation as expressed by John D. Small, CPA administrator, in his telegram to the local congressional committee is considered completely inadequate. This report addressed to Franck R. Havenner stated:

"Re joint telegram California members of Congress concerning acute shortage steel sheet and strip. Unfortunately shortage is nationwide and is particularly serious in light gage black plate and galvanized sheet which are produced on facilities presently required for tinplate to package perishable foods. Steel is being shipped to West Coast but no report available on interarea steel shipments. Manufacturers of critical housing items have been given preference ratings for third and fourth quarter steel requirements. Shortage of warehouse stocks probably due in large extent to direct mill purchase by former warehouse customers whose war expanded facilities require quantities large enough to permit direct mill orders. (CPA is aware of problems you mention and the difficulties they present.) Representative being sent to confer with Columbia Steel which is large supplier of steel to California. Every effort will be made to spread available supplies equitably."

THIS same committee of congressmen sent the following blunt declaration of their dissatisfaction with action taken thus far by CPA, directly to President Harry Truman, John D. Small, Paul Porter, Wilson Wyatt and John R. Steelman:

"Strong feeling exists among all groups interested in steel for the Pacific Coast that J. D. Small telegram of Sept. 24 fails to answer our telegram of Sept. 19 and previous correspondence with him. Present steel sheet and pipe situation on Coast for fourth quarter seriously endangers the entire economy. Outlook for November and December is worse. This situation definitely warrants your serious consideration. Meyers of CPA steel branch during recent visit offered no assistance or hope for assistance. His opinion that overorder-

ing from Columbia Steel by a few individuals is responsible for situation is absolutely preposterous and is disproved by facts.

"Columbia Steel advises that only by obtaining additional tonnages from eastern producers can relief for West Coast fabricators be obtained. We request reconsideration filed with CPA by Coast fabricators who are direct mill purchasers. Majority of applications from this group have been processed with no consideration for reasonable operational requirements of applicants. Majority cannot possibly maintain operations on tonnage allotted. We further request immediate steps to guarantee shipments of steel to ware-

"Majority of fabricators on Coast are small warehouse purchasers who wil! definitely close doors unless steel is made available in at least quantities shipped to warehouses during fourth quarter of 1945. Historically majority of warehouse tonnage has come from

eastern producers. This pattern

cannot be changed now as Columbia is not and never was in position to begin to satisfy minimum warehouse requirements. Unless adequate consideration is given to West Coast steel problem and unless substantial and immediate assistance is provided to equalize steel distribution nationally, the housing program will be seriously hampered and widespread unemployment will result."

RECENT published reports from Washington in which government officials are said to have stated the equivalent of "to heck with the West" and in general expressed an attitude of indifference to what many out here believe to be one of the most serious economic situations existing today, have done nothing to assuage the temper of fabricators who see negligible inventories dwindling to the point where they are faced with closure within a few months at the latest.

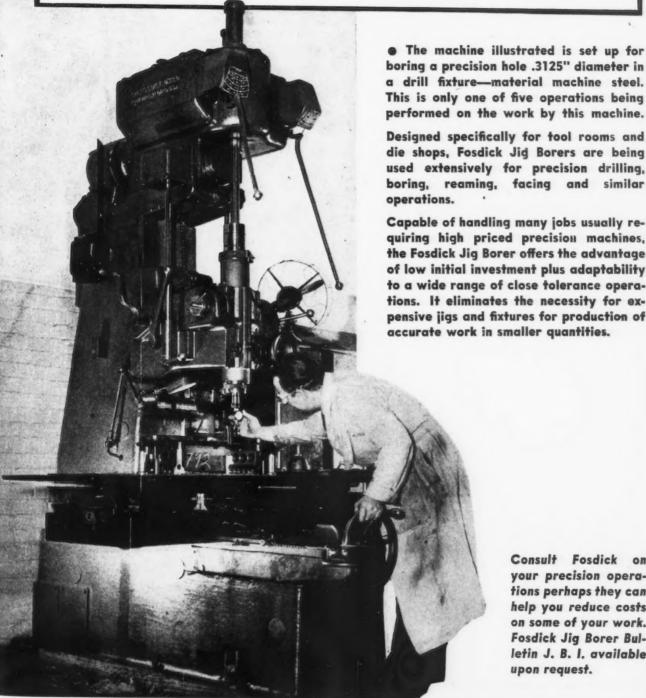
There is a strong feeling that the only hope of material relief will be through presidential action but there is a question as to what direction such action might best be aimed. Whether pressure from the Chief Executive upon steel companies to be more generous in shipments to this area would be availing is considered problematical because of the economics involved and there is a generally well-founded belief that the only hope is for some price relief which would make shipments into this territory profitable.

That eastern mills are deliberately discriminating against this section in favor of eastern manufacturers is generally discounted as it is pointed out that the western market is now and will continue to be a very large one for many grades and types of steel for years to come.

CCAL representatives of eastern steel companies who are now on the pan are emphatic in their declaration that there is nothing more complicated involved in the shortage than the fact that demand nationally is extremely heavy and the logical place to sell merchandise is where it will bring in the greatest profit.

Occasionally, dissatisfaction is

Designed for Precision Operations FOSDICK JIG BORER



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to sell bring ion is boring a precision hole .3125" diameter in a drill fixture—material machine steel. This is only one of five operations being performed on the work by this machine.

Designed specifically for tool rooms and die shops, Fosdick Jig Borers are being used extensively for precision drilling, boring, reaming, facing and similar

Capable of handling many jobs usually requiring high priced precision machines, the Fosdick Jig Borer offers the advantage of low initial investment plus adaptability to a wide range of close tolerance operations. It eliminates the necessity for expensive jigs and fixtures for production of accurate work in smaller quantities.

> Consult Fosdick on your precision operations perhaps they can help you reduce costs on some of your work. Fosdick Jig Borer Bulletin J. B. I. available upon request.

FOSDICK MACH

voiced by some warehousemen and sheet metal fabricators over the action being taken to improve the material situation here. Charges have been heard that trade associations and other organized groups have not taken a militant enough stand either because they do not wish the world at large to know that shortages exist and thus possibly discourage the establishment of new businesses, or because of pressure being brought by eastern manufacturers who wish to take advantage of the material shortages here to stifle the development of independent producers. However, these charges apparently are not being taken seriously and are refuted by the accumulation of correspondence and press clippings in the hands of those subjected to criticism

The local CPA office has been extremely active in sparking the campaign for delivery of more steel—primarily sheet for the building industry, but officials from here who have been in Washington on this and other business are far from optimistic.

APPRECIATIVE of the seriousness of another shortage—that of steel scrap—the California Manufacturers Assn. is conducting an aggressive campaign by direct mail to bring out more scrap and has appealed to members and other manufacturers to not only get out the scrap around their own plants but has urged them to write to the heads of the Maritime Commission, War Assets Administration and Naval heads in an effort to speed up the scrapping of ships.

Maintaining that California mills and foundries are today receiving only 65 pct of their scrap requirements and that 50,000 tons more per month are required immediately, they are recommending a 3-point

program:

(1) Resurvey every part of a plant to locate scrap metal; take a hard-boiled viewpoint toward unused and outmoded equipment — declare the maximum scrap; heckle scrap collectors and dealers to pick up scrap promptly; and take these steps at once.

(2) Insist that the Maritime Commission and Navy adopt efficient methods of promptly selling ships destined for scrap and to sell ships in larger lots; and urge government agencies to cut all red tape in connection with the scrapping operation.

(3) Carry the scrap drive to the public and state and municipal governments; and do everything possible to urge farmers to bring in their scrap.

M ORE than 500 steel construction men will gather at the Hotel del Coronado, Coronado, Calif., Oct. 28 for the 4-day national convention of the American Institute of Steel Construction, Inc., according to Paul F. Gillespie, president of the Judson Pacific-Murphy Corp., who is convention chairman and L. A. Peck, of the same company, convention director.

Members of the institute are expected to begin arriving at Coronado Sunday, Oct. 27, and a full program has been arranged for each succeeding day. Monday will be devoted largely to a business session and will be addressed by Harrison S. Robinson, San Francisco industrialist, on the subject of "Some Observations on Government, Business and Labor." Tuesday is set aside for recreation and Wednesday will be taken up with technical sessions where the principal address will be given by F. W. Panhorst, bridge engineer for the State of California, on the subject of "Bridge Construction as Adapted to California Requirements." Thursday, John B. Hughes will speak on "Future World Civilization." Election of officers and directors will take place in the afternoon and a dance will be held in the evening.

The general committee in charge of the convention includes Alden P. Roach, president of Consolidated Steel Co. of Los Angeles; Charles McGonigle of Poole & McGonigle of Portland; Paul Piggott, president Pacific Car & Foundry Co. of Seattle; E. F. Gohl, Bethlehem Pacific Steel Corp., San Francisco; J. R. Fox, American Bridge Co., San Francisco; J. Philip Murphy, Judson Pacific-Murphy Corp., San Francisco; and C. Arnholt Smith, National Iron Works, San Diego. Paul Coddington. Lakeside Bridge & Steel Co. of Milwaukee, Wis., is president.

SALT LAKE CITY—The fourth of the nine openhearth furnaces at Geneva steel plant is scheduled to go into production this week. Preparations for early reopening of the structural mill, including the rolling and stockpiling of some blooms, are also underway. The railroad car bottleneck may delay the start of the structural mill, it is reported, and will affect its operation level.

The plant personnel problem is still being aggravated by an acute housing shortage. Fifty-eight executives and supervisory employees are living in a Provo, Utah, hotel and others are declining to come to Geneva until housing for their families can be provided, according to a company spokesman. Federal Housing Administration is working on a program for construction of additional houses in the area, some of which are expected to be in the higher price brackets.

Los Angeles — Production know-how developed during the war by the American aircraft industry must be preserved, in the opinion of Prof. Horace N. Gilbert, California Institute of Technology, at the closing session of the SAE National Aeronautic Meeting.

He pointed out that the manufacturing function, so important during the war, may not be so important now in individual cases. Other functions, especially engineering or, in the case of personal planes, sales, may now be more important than production. The excellence of manufacturing practices that is a heritage from the war constitutes an expensive way of doing business unless production volumes are high or unless management is extraordinarily clever in keeping costs down. Not all companies were equally successful in mastering advance manufacturing practices during the war so that today some are still trying to find answers to elementary questions.

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The aircraft industry learned a great deal from wartime experience about manufacturing performance standards so that the jobs of production planning, cost estimating and pricing can be carried on more satisfactorily than before the war. Although marked technical progress took place in the field of aeronautical engineering, wartime experience was disappointing in that little if any progress was made in shortening the elapsed time for engineering development, and the costs of such work became exceedingly high.



Research Man With A Loose Foot

The Armco research man is no homebody. This sheet steel specialist is always on the move—visiting designers and manufacturers of buses, streamlined trains and planes, television equipment, and new steel products for home and industry. And he takes his research skill along—works right in the plant with the men who make the products.

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Knowledge gained this way helps Armco tailor sheet steel to a particular need—to route scores of different orders through the mill departments for individual processing.

Out of this teamwork between Armco and the manufacturer have

come many ideas for improving fabricating methods and cutting manufacturing costs. Also ideas for such special-purpose sheets as ARMCO PAINTGRIP that takes and holds paint, Ultra-thin Electrical Steels, new Aluminized steel and others.



Back of this fact-finding in the field stand the modern laboratories of The American Rolling Mill Company. These laboratories, which had their beginnings 45 years ago, give Armco the oldest and largest research organization in the field of special-purpose flat-rolled steels.

The days ahead will bring even greater demand for versatile sheet steels. Armco research, working closely with the men planning new products, can be counted on to develop the special sheet steels to do the job—and do it best. The American Rolling Mill Company, 3161 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

THE AMERICAN ROLLING MILL COMPANY

THE IRON AGE, October 17, 1946-87

European Letter . . . JACK R. HIGHT

• British Steel Control Board appointments received with some criticism... Steel exports to decline in last quarter... Recruiting drive on for new metallurgists.



ONDON-The British Iron & Steel Control Board has held its first meeting, and the last member has been appointed, but the first meeting was reported to be primarily a get-acquainted conference with no prepared agenda. The seventh and last member of the board is Sir Wilfrid Ayre, representing several shipbuilding firms. Earlier this year he headed a mission to South America which is reputed to have returned to Britain with \$120 million worth of orders.

Critical comment on the other

steel board appointments has been reserved, but has been heard from some quarters. The appointment of R. Mather, chairman of the Skinningrove Iron Co. Ltd., may have been somewhat of a surprise to some observers, as the advance leaks had mentioned other possibilities. Mr. Mather achieved some measure of local fame in the broad nationalization struggle last spring when he threw into sharp relief in the press one of those rare fissures in the British Iron & Steel Federation armor.

When the federation drew up its plan for modernizing the British iron and steel industry the following harsh words were used in the official statement in regard to Mr. Mather's firm, Skinningrove:

"It is considered (by the federation) that while the company's works fulfill an important function in the present economy and operate on a manufacturing cost basis which bears favorable comparison with many other works, no permanent future can be seen for this works in the long term plan."

In the subsequent nationalization debate in the House of Commons the Minister of Supply noted for the government that the existing federation did not have the necessary power to enforce its modernization plan, and cited as evidence the fact that Mr. Mather had written to the federation ob-

jecting to the harsh prediction for the future of the firm, and stating that the Skinningrove management did not approve of this section of the modernization plan.

Following this one spate of mild revolution, the matter was apparently carefully herded back inside the soundproof walls of Steel House, where the federation meets, and no more public discussion has continued in this regard. Whether there is any connection between the Minister's interest in the welfare of this firm last spring and the socalled surprise appointment of Mather is a matter that has not been settled here as yet.

The other member for the steel industry was an oft predicted choice (see THE IRON AGE, Sept. 12, p. 97), as Mr. Latham's position and prominence would have been hard to deny. Historically it might be interesting to recall once more that his firm was the last important holdout when the federation was formed, and that long after the federation was established Latham was its most respected adversary. Since that time he has risen to prominence in federation affairs, but his firm is thought to still be somewhat less "strong federation-minded" than some others in the industry.

THE appointment of the two trades union representatives has been well received here. Lin-

BRITISH STEEL BOARD CONVENES: First portentous gathering of the men who are to control the British iron and steel industry on behalf of the British Government was held Oct. 2. Left to right are Mr. Lincoln Evans (general secretary of the Iron and Steel Trades Confederation); Mr. A. Callighan (general secretary of the National Union of Blast Furnacemen); Mr. A. C. Boddis (Ministry of Supply, secretary of the board); Sir Archibald Forbes (deputy secretary of the Ministry of Aircraft Production, chairman of the board); Sir Alan Barlow (joint second secretary of the Treasury); Mr. C. H. Latham (chairman and managing director of Whitehead Iron & Steel Co. Ltd.); Mr. Richard Mather (chairman and managing director of Skinningrove Iron Co. Ltd.).





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Complete details of Frasse alloy stocks—actual quantities and grades available for immediate delivery—are published monthly in the "Frasse Alloy Bar Inventory" bulletin. You'll find this bulletin an invaluable check list for your requirements in alloy bars. Send for your free copy of the latest issue today. Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200). 3911 Wissabickon Avenue, Philadelphia 29, Pa. (Radcliff 5-7100). 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000). Jersey City • Syracuse • Hartford • Rochester • Baltimore

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Little can be safely predicted as to the relative position of the various members of the board on important issues. The Treasury members, in addition to offering financial advice, will presumably tend to support the chairman and through him the minister. The chairman's background is so distinct from the steel industry that his specific views are probably largely nebulous, but he is the choice of the Minister of Supply and must roughly agree with his boss—though he will have a full understanding of industrial problems.

The two trade union men represent the best organized backbone of the Labor Government's support, and will have a strong voice behind their votes. The two steel industry men will presumably go into the meetings carrying the banners of the British Iron & Steel Federation and controlled private enterprise, unless the circumstances outlined above should have some bearing on their opinions.

While the future of the British steel industry is still in this planning state, there is little that can be predicted, but there appears to be potentially explosive material available in the character of the board. Whether the dangerous percussion cap will appear remains uncertain.

WHILE the control board is getting itself on its feet, the steel industry is becoming more concerned with an increasing number of stories of how the steel shortage is affecting industrial recovery, and particularly how it is affecting the British export drive. There is an increasing shortage of sheet as the automobile industry expands its production, although sheet output would probably go up if semi-finished supplies could be expanded.

To protect future sheet supplies the Minister of Supply has announced that next month a new rationing system will be in effect. All companies are reporting what sheet orders are on the books and

Steel Chief Coming

London

• • • Sir Andrew Duncan, chairman of the British Iron & Steel Federation was to have sailed for New York on the maiden voyage of the refitted Queen Elizabeth on Wednesday, Oct. 16.

will await future instructions from the government as to which will remain. The domestic market is said to be receiving more sheet today than before the war, but is unable to keep up with the pent-up demand.

One of the basic difficulties in expanding production is the shortage of labor, as certain facilities were closed during the war. These plants have found it extremely difficult to recruit the men needed to reopen.

A generally disappointed air is found here in regard to the receipt of semis from abroad, which is not aimed at any one specific country. Strikes, coal shortages and labor shortages have combined to make semifinished steel hard to deliver this year. There have been inquiries in Britain recently from American sheet consumers who would like to alleviate the American sheet famine by U. K. purchases, with no success. There were some offers to return British sheet for American sheet bars, but with no noticeable success.

HE most serious aspect of the ever-tightening general steel situation is that the export quota must be cut down if British consuming industries are to maintain production and make their contribution to exports. In the first half of this year steel shipments were among the most encouraging aspects of the general export program at an annual rate of about 1.69 million tons per year. In the third quarter of the year the rate has been reduced to 1.12 million tons, and the present schedule for the fourth quarter calls for an export rate of about 1.05 million tons on an annual basis.

An integral part of the general export program is the system whereby the government nominates what it considers to be essential export orders as far as the steel mills are concerned. Whether these shipments are to go to Britishowned firms in foreign countries or to others, they must be first of all approved by the government.

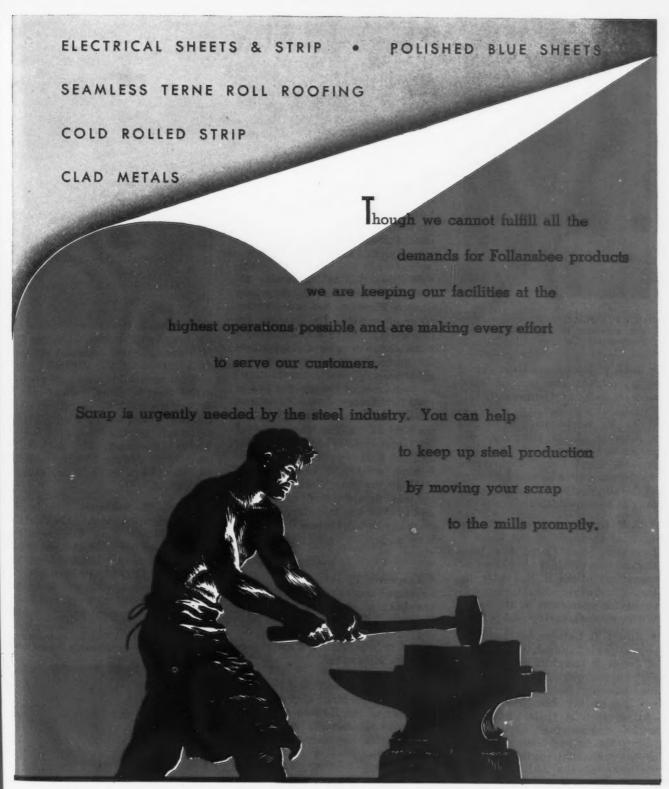
One of the most serious limiting factors on raw steel production is the continuing serious coal shortage. In addition to the efforts which are being made to step up coal production, the government is sponsoring by subsidy a program of substituting oil for coal wherever possible. Conversations have been under way for some time and there should be some slight easing evident during this quarter as a result, but any substantial gains will probably be reflected in the first quarter of next year.

As a part of an extremely long range program to interest young men in studying metallurgy, a number of interested British organizations are cooperating in an educational drive aimed primarily at schoolboys which will include the use of special booklets, films and lectures. A general committee on metallurgical education was formed late last year with representation from the Iron & Steel Institute, the Institution of Mining & Metallurgy, the Institute of British Foundrymen, the Institute of Metals and the Institution of Metallurgists.

As a primary step the committee has sponsored the publication of a booklet entitled "Metallurgy, A Scientific Career in Industry" which outlines the training required, the opportunities, the metallurgist's field and the professional status for those who may be interested.

The booklet is being distributed to those schools which have students about to decide upon their further training, and the committee hopes that enough interest may be aroused from the discussion therein to encourage teachers to request special film showings and in some cases lectures.

It is noted in the introduction that in the past most boys who have been interested in chemistry and physics have followed their education in Great Britain in the direction of pure science, and it is suggested that this possibly may be because they are unaware of the "less frequented paths," or because they are doubtful where they may lead, or because they consider them intrinsically inferior.



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JOHN P. ROCHE, vice-president, general manager of sales and director, Heppenstall Co.

- John P. Roche has been named vice-president and general manager of sales of Heppenstall Co., Pittsburgh, Bridgeport and Detroit. Mr. Roche will also become a director of the company. He comes to Heppenstall from Oliver Iron & Steel Corp., Pittsburgh, where since 1944 he was secretary of the corporation as well as assistant to the president.
- C. R. Dobson, formerly chief industrial engineer of the Jones & Laughlin Steel Corp., has been elected vice-president in charge of operations of the H. K. Porter Co. Inc., Pittsburgh. Mr. Dobson will supervise operations of the seven Porter manufacturing plants.
- Albert T. Lawson has been appointed chief industrial engineer of Jones & Laughlin Steel Corp., Pittsburgh, succeeding C. R. Dobson, who has resigned. Mr. Lawson began his association with J&L in 1916 at their Pittsburgh works engineering department. Since 1930 he had been in charge of the industrial engineering department at the J&L Aliquippa works.
- E. C. Coombs, formerly chief service engineer and assistant manager of sales engineering, has been appointed assistant sales manager for Federal Machine & Welder Co., Warren, Ohio. Prior to taking charge of the sales engineering division, he had been in charge of the production planning and scheduling department since 1940.

PERSONALS

• John L. Cotsworth has joined the Chicago Steel Service Co., Chicago, as sales promotion manager.

• George J. Papas has been appointed general manager of purchases for the Rheem Mfg. Co. He will make his headquarters in New York and will direct purchasing for the company's 11 plants in the United States. He joined Rheem over 5 yr ago in Chicago.

- William B. Cushing, works accounting supervisor, American Steel & Wire Co., has retired after 46 yr of service. Mr. Cushing began work with the wire company's American Works as a stock clerk. He advanced steadily through a succession of assignments until he became chief timekeeper and in 1906 bookkeeper at the Cleveland office. He was advanced to the position of chief clerk at one of the company's Cleveland plants and in 1925 was transferred to Donora where he became chief clerk of the Zinc Works. In 1943 he was named chief accountant and in 1944 was transferred to the company headquarters in Cleveland as works accounting super-
- Lawrence C. Johnson has been appointed manager of the Milwaukee branch of the Minneapolis-Honeywell Regulator Co. to succeed Harold Pride who has resigned to join the Boyd Engineering Co., Milwaukee.
- Alex D. Roubloff has rejoined the Farnham Mfg. Co. as chief engineer of the Buffalo plant. He was with the concern for several years during the war.
- Walter E. Lucas has been named to the new position of director of Morrison Steel Products, Inc., Buffalo. He formerly was employment manager of the Curtiss-Wright Corp. Kenmore plant and later personnel manager of the Curtiss airport plant.
- Wilma Soss has been appointed public relations consultant of the Budd Co., Philadelphia. She was formerly with the Evans Products Co.

- Ben W. Bittner has joined the staff of the industrial division, Bryant Heater Co., Cleveland, as sales engineer. Mr. Bittner was previously associated with General Alloys Co. and North American Mfg. Co. in sales engineering and with Crucible Steel Co. as combustion engineer.
- R. B. Tripp, vice-president, Ohio Forge & Machine Corp., Cleveland, has been elected a director of the Reynolds Wire Co., Dixon, Ill.
- Dr. Otto P. Geier, for 33 yr director of employers' service, at the Cincinnati Milling Machine Co., Cincinnati, has retired and P. H. Cove, a veteran of 28 yr service with the company, succeeds him. Sol Einstein, vice-president, is stepping down from the executive position but will remain on the board of directors. Lincoln P. Mehlope is taking over the duties relinquished by Mr. Einstein, but will not succeed him as vice-president. Carl F. Roby, former managing director of the Birmingham. England plant, has been appointed assistant to the vice-president, Walter Tangeman. Mr. Roby has been with Milling Machine since 1916 and has been in England since 1934.

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• James M. Surbrook has been elected vice-president of the Peninsular Grinding Wheel Co., Detroit. He will also continue as treasurer of the company. Before joining Peninsular, Mr. Surbrook was for 8 yr connected with the Detroit Body Die Co.

JAMES M. SURBROOK, vice-president, Peninsular Grinding Wheel Co.





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B. E. DRURY, JR., sales manager, Wilson Foundry & Machine Co.

- B. E. Drury, Jr. has been appointed sales manager of Wilson Foundry & Machine Co. of Pontiac, Mich. Before being named sales manager, he served as assistant to the vice-president in charge of sales. He has been a member of the Wilson organization since 1942.
- Howard K. Nason has been promoted to associate director of the central research department, Monsanto Chemical Co., Dayton. Mr. Nason has been associated with Monsanto since 1936, and since 1944 has been director of development of the central research department.
- Charles B. Thornton has been named director of the planning office of the planning and control division of Ford Motor Co., Dearborn, Mich. Edward O. Snow has been named assistant manager of Ford's St. Louis district, and Charles G. Johnston has been appointed assistant district manager for Ford at Chester, Pa.
- J. A. Hill, formerly manage of the New York branch office of Independent Pneumatic Tool Co., has been appointed manager of electric tool sales and will be in the company's general offices at Chicago. He has been connected with Independent Pneumatic Tool since 1920. W. C. Rush, formerly in the St. Louis branch, has been appointed manager of the new Cincinnati office.

- · Raymond C. Gintert has been named superintendent of the Cleveland hot and cold strip mills of Republic Steel Corp. Mr. Gintert, formerly superintendent of hot strip rolling in Warren, Ohio, for Republic, succeeds William Rodgers, who was recently appointed assistant chief metallurgist of Republic. William E. Boger has been named assistant superintendent of the Cleveland strip mill. He was formerly assistant of the cold strip department in Warren. Emil G. McCauley has been named superintendent of Republic's Warren strip mills succeeding Mr. Gintert. Mr. McCauley has been assistant superintendent of the Warren hot strip mills since
- · Orland J. Engle has been elected comptroller of Pullman-Standard Car Mfg. Co., Chicago, and George C. Thiele has been appointed assistant to the vice-president. Mr. Engle started in the industry as an openhearth furnace worker at the Forged Steel Wheel Co. plant, Butler, Pa., then affiliate of Standard Steel Car which later became part of the Pullman-Standard group, Mr. Thiele joined the organization as a payroll clerk in 1904. Mr. Engle succeeds Richard W. Higgins, veteran of more than 54 yr of Pullman-Standard service. Mr. Higgins will continue in the corporation's employ in a consultant capacity.
- B. M. Loewenstein has been appointed general sales manager of the Howard Foundry Co., Chicago. During the war, Mr. Loewenstein was head of the casting division of the gun turret plant of Emerson Electric Mfg. Co., St. Louis.
- Kenneth J. Moran, formerly service engineer for the Foster Machine Co., has been appointed to handle the midwest territory of Canedy-Otto Co., Chicago Heights, Ill. John W. Beachem will handle the southern territory.
- Frank P. Smith has been appointed a sales engineer in the Cleveland region for E. I. du Pont de Nemours & Co. After Nov. 1. Mr. Smith's office will be located at Pittsburgh. Since his return a year ago from duty with the U. S. Navy, Mr. Smith had worked in the Philadelphia area.

- F. J. Brecher, who for the past 6 months has been a structural designer with Bethlehem Steel Co.'s Pittsburgh district office, has been transferred to the fabricated plate division at Steelton, Pa., where he will be in charge of scheduling.
- James D. Greensward has been appointed assistant to William C. Johnson, vice-president of the general machinery division, Allis-Chalmers Mfg. Co., Milwaukee. Mr. Greensward has been associated with Allis-Chalmers since 1922, having worked in the machine shop, steam turbine division and electrical erecting and testing department. In 1936 he was placed in charge of sales of the company's switchgear division and in 1942 he was named assistant manager of the central station and marine department.
- Harold E. Adams has been appointed assistant to the vice-president and general sales manager of Ekco Products Co., Chicago. He was formerly western sales manager for the Toastmaster Div. of McGraw Electric Co.
- Ben L. Wise has been appointed production engineer of National Electric Welding Machines Co., of Bay City, Mich. He was formerly assistant general manager of Federal Machine & Welder Co. of Warren, Ohio, and prior to that he was associated with Westinghouse Electric Corp. as application engineer.

BEN L. WISE, production engineer, National Electric Welding Machines Co.



THE IRON AGE, October 17, 1946-93

- Daniel J. Keefe has assumed his new post as manager of the Buffalo sales office of American Radiator & Standard Sanitary Corp., coming from the New York sales office as successor to Harold C. Day, who has been promoted to field manager of general sales, with headquarters in Pittsburgh.
- Arthur W. Frank, district manager, Hevi Duty Electric Co., Chicago office, has been appointed director of research with headquarters at Milwaukee. Lawrence S. Tilden, formerly assistant district manager, succeeds Mr. Frank as district manager in Chicago.
- Dr. Harner Selvidge has joined Bendix Aviation Corp., Detroit, to head a special group recently formed to expand the company's program of research on controls and engine accessories for guided missiles and pilotless aircraft. He was formerly associated with Johns Hopkins University.
- J. G. Trudinger, plant engineer of General Electric Co.'s Lynn River works, Mass., has retired after 39 yr with the company. He was first employed by GE as a draftsman. After several years in this work, he transferred to the maintenance and plant engineering division, which he has headed for more than 20 yr. Edward R. Stettinius, Jr. and Robert T. Stevens have been elected directors of General Electric Co., Schenectady, N. Y.
- Robert C. Neiswander has been appointed sales manager of the Hertner Electric Co., Cleveland.

- · Earl W. Mahaney, former metallurgist, at Brier Hill plant of Youngstown Sheet & Tube Co., has been moved to the main offices in Youngstown, Ohio. He is associated with Karl Fetters, special metallurgical engineer, and works out of the office of J. L. Mauthe, vice-president in charge of operations. Mr. Mahaney joined Youngstown Sheet & Tube Co. in 1936. He worked in the Campbell laboratory plant before he was transferred to the Brier Hill plant. Adolph J. Boehme, tax and land agent for Youngstown Sheet & Tube Co., has retired because of ill health after nearly 40 yr with the company. For 16 yr Mr. Boehme was chief field engineer. When the company purchased Brier Hill Steel Co. of Youngstown and the Steel & Tube Co., Chicago, Mr. Boehme was transferred to the main office as a member of the legal department, with title of tax and land agent.
- Ralph S. Merkle has been appointed manager of parts sales for Sylvania Electric Products Inc., Emporium, Pa. He joined the staff of Sylvania Electric in 1929 serving progressively as sales engineer, sales representative, commercial engineer and in customer technical service.
- Reginald C. Smith has been promoted to contract manager, Eastern district of the H. K. Ferguson Co., with offices in New York. A member of the organization for the past 3 yr, Mr. Smith has been project manager in charge of some of Ferguson's large wartime operations.

- John M. Lambert has been appointed the manager of consumer sales of York Corp., York, Pa. He joined the organization in 1918.
- Louis M. Kuilema, formerly district sales manager at the Cincinnati office of Pennsylvania Salt Mfg. Co., Philadelphia, has been placed in charge of the Wisconsin territory as district sales manager. His permanent headquarters are in Chicago. Charles W. Dermitt has been moved to Cincinnati as Mr. Kuilema's successor after 4 yr as assistant to William P. Snelsire, Pittsburgh district sales manager.
- James J. Welker has been appointed general manager of Willys-Overland Motors, Inc., in charge of its west coast plant at Maywood, Calif.
- V. E. Boyd has been appointed assistant to H. C. Doss, vice-president and general sales manager of Nash Motors, Nash Kelvinator Corp., Detroit. L. D. McCartney replaces Mr. Boyd as sales office manager.
- William G. Flaherty has been appointed chief statistician of Chrysler Corp., Detroit, succeeding John W. Scoville, resigned. Charles W. Craig has joined the public relations department of Chrysler Corp. He was formerly associated with the General Electric Co. in Schenectady, N. Y.
- J. A. Herrmann, former field engineer of the BullDog Electric Products Co., Detroit, has been appointed director of engineering of that organization.

- Orville L. Beardsley, 42, director of the personnel department's service activities section of the personnel staff of General Motors Corp., Detroit, died unexpectedly Sept. 30.
- Ralph C. Stiefel, Jr., 44, president of the Hi-Alloy Castings Co., Ellwood City, Pa., died Oct. 5. He was also a director of Aetna Standard Engineering Co.
- Harry H. Donnelly, 26, co-owner of the Frank T. Donnelly Co., Pittsburgh, died Oct. 7 after a 2-week illness.

...OBITUARY...

- Walter Douglas, 75, former president of the Phelps Dodge Corp., New York, from 1917 to 1930, died Oct. 3.
- Leslie Byers, manager and vicepresident of the Cortland Grinding Wheels Corp. of Chester, Mass., died recently.
- A. Elton Holcomb, 68, former crane and shovel division sales manager for the Koehring Co., Milwaukee, died Oct. 5.
- Dr. R. Max Goepp, Jr. was killed in the Oct. 3 crash of the American Overseas Airlines plane in Newfoundland. He was returning to Germany to complete a study of emulsifiers and detergents. Dr. Goepp was director of organic research for the Atlas Powder Co., Wilmington, Del.
- D. T. Williams, 91, founder of the D. T. Williams Valve Co. of Cincinnati, died recently. He has been retired for some years.
- Hilmer J. Hurum, 34, part owner and sales manager of Carbon Specialty Co., Slinger, Wis., died Sept. 30.

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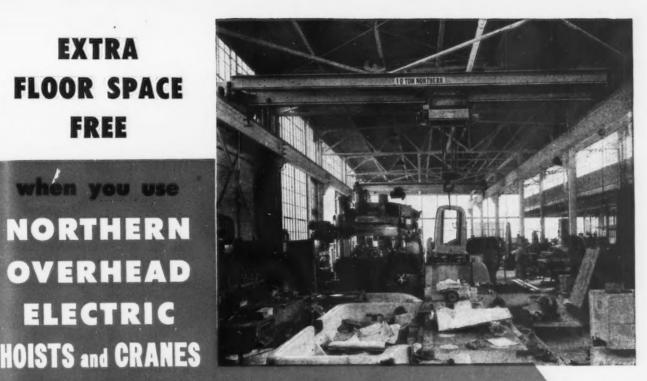
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when you use NORTHERN **OVERHEAD ELECTRIC**



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But when the floor space has to carry the burden of material movement as well as processing operations, a much smaller proportion of the total is available for work or storage. Clear aisleways must be larger—which may waste a lot of valuable space.

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Dear Editor:

RE: DEFENSE OF WELDING

Sir:

Through my experience my reaction to reading Mr. J. F. Lincoln's letter in "Dear Editor," p. 104, Sept. 26, is to feel that "Welding Needs No Defense." My work as consulting engineer who has designed and supervised construction of many welded building structures has made me more familiar with this use of welding, than other uses, but my interest developed by this use of welding has made me interested in its application in other types of welded work.

Fundamentally if anything could be claimed against welding it is due to the fact that it is such a simple and direct process compared to those used in other types of connections, its very simplicity creates a belief that it may not be good. Due to constant technical research undoubtedly more is known about weld behavior than has ever been known about rivet behavior. Unfortunately this constant striving to create better welding material and techniques has led those in charge of some of these programs to overlook the fact that welds made years ago under not such perfectionist requirements are holding quite as well as their riveted counterpart. This constant striving for better results when excellent results were already an accomplished fact has. I believe, created suspicion in the mind of those not too familiar with what has been done, for they do not understand that these recommended changes often represent most minute improvements but they are improvements just the same.

Those interested in welding feel that publishing these improvements in specification form is the one thorough way to get this latest information into the hands of every one interested in welding, but in their enthusiasm and caution to see that nothing is done, unless it be done in what the specification writer conceives to be the proper way, some very uncalled for requirements have been put into these welding code specifications.

As Mr. Lincoln states, these code writers often make no statement of the fact that much good had been accomplished under some previous similar code. The results of all this are many highly impractical requirements which burn up any old hand who has spent years in welding.

This is especially true when a person familiar with the great strength and reliability of welded connections is confronted with a critical comparison of the value of a similar riveted connection of which so little testing of full size connections has been made that comparatively little is known of the true performance of the rivets. As Mr. Lincoln suggests, few engi-

neers worry about the fact that hotdriven rivets do not completely fill the hole in which they are driven even though the connection is designed on the assumption that they do fill the hole.

. In the beginning of the use of riveting the same questions developed as to its safety as are now being asked about welding. While this is irritating to one familiar with welding, it seems to be the forge through which public approval can be won if advantage is taken of all of the well known factors helping to make up a conservative and safe as well as economical welded structure . . . So far as today's structural engineer is concerned he is trying to learn about welding with little concentrated assistance from those who should be interested in its wider application. If for no other reason than that these people would sell more welding equipment and material they should be interested in personal contacts for the structural field is probably welding's largest undeveloped outlet. Many times I have proved to my clients satisfaction that welding is by far the most economical method for the assembly of steel as used in any type of structure, so I feel that if Mr. Lincoln will just be a bit patient he will not wait too long a time to see the day welding will be the accepted process for steel assembly, for no obstructing tactic ever stopped an economical proven process.

I have often wondered why the many large companies, such as Mr. Lincoln's, who are vitally interested in widespread dissemination of the "how to do" of structural welding, have not gotten together through one of their existing trade organizations such as NEMA to set up an independent engineering advisory group, which could on request visit and assist practicing engineers to develop correct and economical welded structural designs. . . . The American Welding Society has done and is doing a fine technical job on the subject of welding but it has not the type of organization set up which can visit engineers' offices to help them on the practical features of welding suggested by the engineering test data developed through the AWS testing and research programs.

In the present grave shortage of steel as used in my business, any method of safe assembly such as welding which can save at least 15 pct in the fabricated weight of any truss or which can save 5 to 10 pct of steel weight required for a multi-story building needs no defense, but rather it needs effort directed towards wider knowledge on the part of the average engineer who makes the basic designs.

Time and continued effort on part of those interested in welding will cure the difficulties Mr. Lincoln so ably discusses.

VAN RENSSELAER P. SAXE
Consulting Engineer
Baltimore 1

SHELL, NOT SUN

Sir:

... We were interested in the article on p. 46, Oct. 3 issue, entitled "Protective Value of Industrial Lubricants," but thought it rather strange that the author was identified as being with the Sun Oil Co., when actually he is affiliated with the Shell Oil Co. We thought we had better call your attention to the error.

J. C. FAIRCHILD

Manager, Advertising and
Sales Promotion

Industrial Products Dept. Sun Oil Co. Philadelphia

• G. H. von Fuchs, author of the article, is associated with Shell Oil Co., Inc., Wood River, Ill. The error was ours and was inexcusable. We won't even attempt to blame it on the proofreaders.—Ed.

CORRESPONDENCE WANTED

Sir

I am a Frenchman and wish to correspond with an American methods or plant engineer in a stamping plant or one active in developing welding assembly jigs. Perhaps through your journal I may be able to locate such a correspondent to exchange technical ideas, know how, and friendship. From 1929 to 1943 I was in the automotive industry as a chief engineer concerned with design of dies and jigs and as research engineer in stamping. I have been associated with Manessius Bodies plant (licensed by Fisher Body); Chausson Bodies (licensed by Edward Budd) and Citroen Motor Cars Co. I am now workshop manager in a plant building kettles and heaters for farm use. These products are manufactured by stamping and welding.

R. G. MIGNOT Workshop Manage

F. Fillod F.S.A. St. Amour (Jura), France

 Reader Mignot's plant employs about 150 men and turns out 100 tons of steel products monthly, some of it apparently galvanized.—Ed.

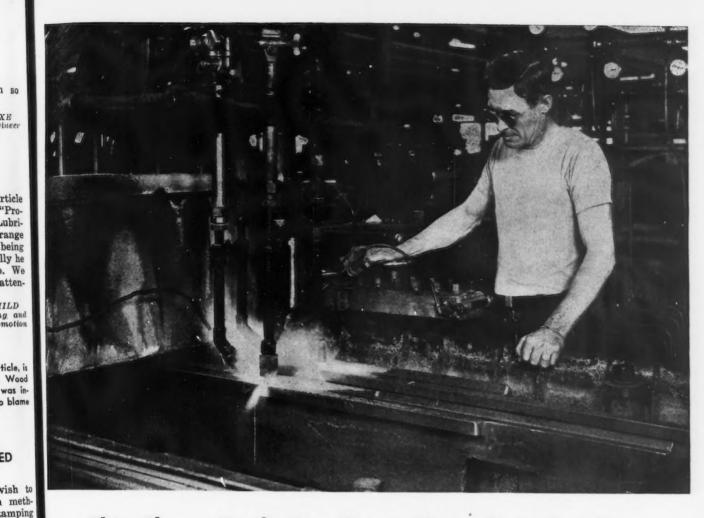
TIME STUDY FOR HOLLAND

Sir:

We will be much obliged if you will kindly send us a copy of the article "Training Time Study Men," which appeared in the issue of Aug. 1.

N.V. Nederlandsche Machinefabriek "A. I."

Amsterdam



This Flame Hardening Keeps Monarch Lathe Ways Rood as New EVEN AFTER 1,090,000 CYCLES

MONARCH

. . This fine tool was used in shell manufacture and during its time in use, approximately one year, turned the burr ring on one million, ninety thousand shells. In examination of the machine, we find the ways as good as new although the movement of the carriage was confined to a short space. This seemed amazing to us after our experience with the older types of construction."

That's unsolicited, written testimony about a standard Monarch 10" EE Toolmaker's Lathe. What wasn't known is that such performance records are the accepted, rather than amazing, experience—for thousands of

Monarch users everywhere. More than 21,000 lathes have left our plant with flame-hardened ways since we first introduced the process for machine tool applications, back in 1937. It's one of the many plus features of Monarch Lathes—features that enable you to produce more for less. We'd welcome the opportunity to show you how Monarch can meet your metal-turning needs. May we talk it over?

THE MONARCH MACHINE TOOL COMPANY . SIDNEY, O.



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Flame-hardened ways are one important reason why you'll get longer life and greater accuracy in this sensitive precision machine. For complete information and detailed specifications, ask for bulletin No. 10-EE.

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Industrial News Summary...

- Price Decontrols May Be Speeded
- No Change on Steel Price Request
- Steel Ingot Rate Stays at 91 Pct

ALTHOUGH price controls in the metalworking industry and particularly in the steel groups may remain in effect during the immediate future for those items which are still considered short, it is apparent this week that the Administration will eliminate price controls as rapidly as possible. The retreat from rigid price control on the part of the Government may take place so rapidly that the current request for higher steel prices may not reach eventual settlement until after controls have been lifted.

The steel industry, however, is proceeding this week on its price adjustment request on the basis that OPA controls will remain in effect. If the latter are removed before a final decision has been made, steel companies will be in a position to make their own individual adjustments. It is significant that the price request now before the OPA is in the form of higher prices for specific products on which the return is low and not on a horizontal or across-the-board basis.

Should controls on basic materials be rapidly removed, it can be expected that price increases will multiply, but on the other hand an adequate check to such moves may present itself in a stiffening in customer resistance. That steel consumers have already become cautious in their buying habits in the midst of serious steel shortage rumors has been apparent for some weeks as manufacturers eye their inventories and scale down their 1947 manufacturing patterns, into better alignment with available steel supplies.

The probability that price controls will be removed at an accelerated rate plus the substantial production of steel expected over the next 3 months is expected to cause more serious thought in the metalworking industry than has been the case for some time. Major steel producers are well aware of the higher costs encountered by manufacturers of durable and nondurable goods and for this reason pricing policies of individual steel companies in the event of a rapid lifting of controls are expected to reflect a conservative attitude.

THIS week it was disclosed that many large building projects have been dropped because of the high cost of materials. One railroad has even gone so far as to cancel projects on which fabricated steel commitments had already been approved. In other cases manufacturers have reduced their pressure on steel companies and have quietly gone along with steel company requests that 1947 consumer requirements reflect a more realistic approach with respect to the availability of steel products.

The bare statements from Detroit last week that automotive plants were being shut down because of the steel shortage fell far short of presenting the total picture. While certain types of steel have not been reaching many automobile companies in the quantities desired to maintain an exceptionally high rate of au-

tomobile production, Detroit has admitted that shortages other than steel have been just as serious—these include copper, lead, fabrics and other items.

Having been subjected to considerable criticism and some questioning as to where steel is going, the steel industry last week was quick to point out that the automobile industry at present is obtaining more than 12 pct of the finished steel being produced. Even though automobile companies rightfully indicate that some of their production lines have been shut down because of steel shortages, especially cold-rolled sheets, it was apparent this week that some lines were curtailed because the volume of raw materials was not high enough to maintain a rate of automobile output which would more than absorb increased costs in that field.

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On the other hand, late statistics indicate that the short item most mentioned—cold-rolled sheets—is being produced in far greater quantities today than it was in the prewar base year of 1939. During the first 9 months of this year cold-rolled sheet production was almost 40 pct ahead of the entire output of this item in 1939. In 1939 cold-rolled sheets constituted 5.8 pct of the total output of finished steel while so far this year they represent 8.4 pct of total finished output. During the first 9 months of this year, despite the steel strike and the coal mine deadlock, the steel industry was only about 1 million tons behind the total output of finished steel in 1939.

THE steel ingot output this week continued, despite production obstacles, at 91 pct of rated capacity. There was every indication this week that steel producers would be able to maintain steel output at the current high levels during the balance of this year. Should there by any chance be a pick up in the volume of scrap, the industry would be able to advance its operating rate from 3 to 4 points above the present level. Steel operators point out, however, that the continual pounding which steel mill equipment is now getting plus what it got during the wartime years will force substantial repair and maintenance programs in 1947.

With signs of future changes in OPA controls materializing it was also apparent this week that the Civilian Production Administration is beginning to take a more definite hand-off policy in regulating the distribution of a portion of steel output. Priority assistance for the fourth quarter will not have the chaotic effect on steel distribution patterns as it did in the third quarter. Furthermore, the attitude of the CPA now that major consumers must take their chance along with others in obtaining a just percentage of total steel output. CPA has also taken a strong realistic position and has become tough on demands for special treatment from many steel consumers.

• NEW MOTOR CAR—Kaiser has entered into an agreement with the Italian Fiat combine calling for shipment of 100,000 automobile chassis from Turin to the U. S. A., according to Milan reports. These sources indicate that raw materials will be supplied from the United States and that cars will be finished in this country by a new firm to be called Kaiser-Fiat. A selling price of \$1,000, 27 miles per gal and plastic body material are mentioned in the story, said to justify Fiat retaining 11,000 workers otherwise doomed to be laid off.

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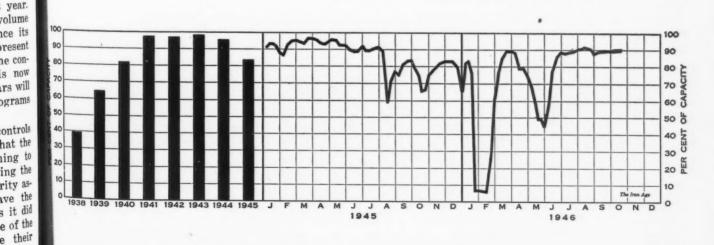
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- CHOICE ON 1947 QUOTAS—Steel shipments for the month of September and so far into October have exceeded the receipts of steel orders, on a tonnage basis, by about 3 to 1. The largest single reason is that companies, with the exception of one large producer, are refusing to accept new business that is not already on the books and allocated by quota. Commitments of steel products for next year will be handled one of two ways. One large producer will give the customer the choice of canceling what is left as a backlog of his 1946 quota and starting anew Jan. 1, or allowing the company to ship against the 1946 commitments until they are completed; the new year's quota to be figured at that time. One company that has opened its books for 1947 canceled outright what was left of the tonnage that they did not think they could roll this year. It is quite obvious that consumers holding priorities, the delivery of which will have to be carried over into '47, will not cancel their '46 quotas if given the choice. Although CPA may not grant any priority ratings, other than that on tinplate, after Jan. 1, the delivery of such rated tonnage will continue into '47 by reason of carried over backlog alone.
- SEPTEMBER STEEL OUTPUT—September production of steel ingots and steel for castings totaled 6,517,212 net tons and marked the third successive month in which this production exceeded 6,500,000 tons, the American Iron & Steel Institute announced. The average operating rate during the month was 86.4 pct of capacity, compared with 88.2 pct in August and 76.3 pct in September 1945. Revised figures place August ingot production at 6,886.863 net tons. One year ago, September production was 5,982,475 tons. For the first nine months of this year ingot production totals 47,342 897 net tons. This figure is less than 2,000,000 tons below similar figures for 1929, the high peacetime year for ingot production.

- NO ODDS AND ENDS—One reason why steel warehouses are so short of cold-rolled sheets is that many of these distributors can no longer obtain odds and ends from steel mills. Many steel warehouses used to prepare these sheets into convenient sizes and market the steel to a wide diversification of buyers. Today there are no odds and ends; automobile plants and other users are finding ways and means to use any cold rolled they can get their hands on.
- STEEL IN BILLION TONS—Nearly 1,910,000,000 net tons of steel ingots and steel for castings have been produced in the United States from January 1901 through August 1946, according to the American Iron & Steel Institute. Almost one-third of that tonnage has been turned out since Jan. 1, 1938. The one-billionth ton was made in the latter part of 1929. The two-billionth ton of steel of the twentieth century will be produced before 1950. The last quarter of this year should add another 15 to 20 million tons to the above stated total. The steel industry's present annual capacity is around 91,890,500 net tons of ingots and steel for castings.
- NEW STAINLESS SERIES—U. S. Steel Corp. is about to announce a new series of stainless steel known as USS heat resisting steel. The new product, which has been under development for some time, is an alloy for use in stoves and other heating equipment wherein the oxidation effects due to intermittent operation have been a problem. The chemistry of the stainless steels involved will be engineered to reduce the usual troubles encountered in such heating elements.
- GENEVA BASING POINT—Geneva Steel Co., newest subsidiary of U. S. Steel Corp., lost no time in becoming competitive with other steel companies this week when it established a delivered basing point price at Geneva, Utah, for Sheared Steel Plates at \$2.675 per 100 lb. Because the corporation announces all prices on a delivered basis, it is assumed that this price is equivalent to \$2.65 per 100 lb f.o.b., Provo, Utah. The previous price born of wartime days was \$3.20 per 100 lb f.o.b., Provo, Utah.

Steel Ingot Production by Districts and Per Cent of Capacity



	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
ctober 8	98.0 98.0	91.5 91.0	88.0 90.0	87.0 87.0	91.5 93.5	102.0 102.0	96.0 96.0	97.0 97.0	92.0 95.0	68.0 77.0	91.0 91.0	74.0 74.0	84.0 84.0	91.0 91.0

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The world's largest rotary furnace, all of America's continuous butt weld pipe furnaces, all of the circular soaking pits, small arms ammunition plants, continuous annealing and heat treating furnaces, and batch type ingot heating furnaces.



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TORONTO, ONTARIO, CANADA LONDON, ENGLAND

Claims Auto Makers Are Getting Full Share Of Current Steel Output

By T. E. LLOYD
Pittsburgh Regional Editor

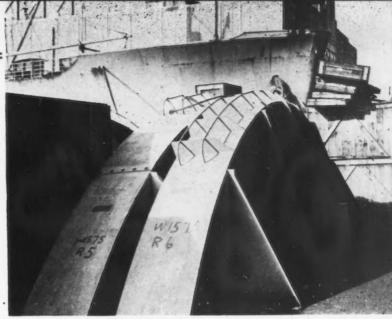
Pittsburgh

• • • The charges by automobile manufacturers that steel shortages were causing layoffs and curtailments brought forth no rebuttal worth mentioning from the steel industry, but certainly weren't ignored. Steel producers still remember and expect to see again the day of aggressive buying policies by auto manufacturers, forcing steel price breaks for no apparent reason.

However, since steel is only one of several items in short supply, the charges are too direct to be ignored. More acute shortages are known to exist in lead and pig iron (the latter because of CPA's allocations to the housing and agricultural programs), and the shortage of copper is serious. The power strike in Pittsburgh, charged as a reason for curtailment of steel shipments to Detroit, has had little or no effect on finished steel shipments. One manufacturer used this as a reason for layoffs, despite contemplated union difficulties in the near future

Various industries have set production sights high as compared to their prewar production. Some sources say that the automotive industry, setting its sights for 5 million cars per yr, has been self-centered in its regard for the needs of other industries. The auto industry, while the largest single steel consumer, is only one of many, and collectively the remainder of the steel consuming industries is as great if not greater in importance.

Recently several top steel companies outlined to the automobile industry an allocation or quota plan that would permit steady production at a rate somewhat below the 5 million cars per yr goal. It is claimed by steel producers that current receipts of steel by the



STEEL EXPORTS SMALL: Despite the clamoring from abroad for American Steel, exports at present are no more than 6 pct of total steel shipments, hence rumors that exports are taking too much from the domestic front appear unfounded. Here is a fabricated section destined for France.

automotive industry will permit operations at a 3,500,000 cars per yr goal. At least one automobile producer considers scaling down its production program a necessity and is working closely with the steel suppliers on this problem.

If steel mills acceded to the 5 million cars per yr demand, other industries would suffer for want of steel and many users would go without. Consequently, the new quota plan was spread before the automotive manufacturers. While current statements by leading manufacturers in Detroit cannot be laid directly to door of the new quota plan, their timing might be significant.

The automotive industry, since the end of the war, has received just about the same percentage of total steel output as it received prior to the war. The end of the war saw major interruptions because of strikes, and the statement by one automotive company that it had received only 58 pct as much steel since VJ-Day as during an equivalent period prior to the war is misleading. Actually, what matters most is the rate of steel receipts at the present time.

The quota plan by steel producers is necessary to insure fair distribution of steel, say steel officials here. Without such a plan, the automotive industry would likely pressure steel mills into deliveries out of proportion to its proper share. Because the total supply isn't adequate, auto manu-

facturers are attempting to justify in the eyes of the public the reduction in car output and to disguise the mistake of an impossible production goal, is the way some observers size up the picture from a steel industry standpoint.

There is no question that overall shortages of steel are limiting production of commodities, according to sources here, but acute shortages of other materials can be as much a part of limiting sustained high production rates as steel. During the past 9 months, auto manufacturers have blamed many things for the inability to hit production goals, but none have pointed out that production goals just might have been too unrealistic and that such goals are unattainable even with a fair share of the available steel in the product mix that enables production to the best advantage.

Product mix with auto manufacturers is highly important and steel mills, taking cognizance of this fact, have attempted to help keep consumer inventories in balance. For example, if sheets should possibly be in greater supply than cold-finished bars, some steel producers would attempt to limit the sheet shipments so that there would be no pile-up of inventory while production lags for want of cold-finished bars. In this attempt, steel producers have met with resistance from automotive producers, the latter preferring to build up inventories regardless of the supply of other materials.

Automakers Say Steel Is Only One of Many Shortages

Detroit

• • • Whatever the respective merits of the controversy now raging as to whether or not the automobile industry is trying to push the steel industry around, a good start on examining the case can be had by reviewing some of the readily obtainable facts.

During the past 2 weeks, Hudson has been forced to stop its assembly lines for a 7-day period, Chrysler has reduced its rate of operations by approximately 30 pct and Ford has cut a day off its operating schedules. In each instance, the industry in its press releases has pointed to a shortage of cold-rolled steel as the immediate reason for curtailing operations although it is freely admitted that steel is not the only item which is short. Lead, tin, paint, glass, brake fluid and many other of the 8000 items required to build a motor car are short and the general feeling in the automobile industry is that if steel did not force a curtailment of operations. some other item would, if not immediately, then in the near future.

The question has been raised by the steel industry: Is the automobile industry trying to push production at too fast a clip, thereby running headlong into material shortages and creating a load too heavy for steel suppliers to carry unless materials are diverted from other industries which need steel as much-or more as some see it than the motor industry.

Without attempting to judge the automobile industry's needs as compared with those of other industries it may be helpful to set down the facts about automobile production for 1946 as they are revealed by the latest production estimates compiled by Automotive

News.

From Jan. 1 to Oct. 5, 1946, Automotive News estimates that 2,145,552 vehicles have been assembled in the United States and Canada compared with 4.108,962 units turned out during the corresponding period of 1941. Thus during a little more than 9 months of this year, the industry has produced 52.2 pct of the cars assembled during the same period of 1941. The record for 1946 shows that two producers-Hudson and By WALTER G. PATTON Detroit Regional Editor

Nash (accounting for 3.16 pct and 3.18 pct respectively of the industry) have actually made more cars in 1946 than were assembled by the same producers during a comparable period of 1941. Studebaker's output so far this year is approximately 80 pct of the 1941

Chrysler and Ford have turned out cars and trucks at approximately the same ratio as in 1941, with the former assembling 55.5 pct as many cars in all divisions this year as were built in the corresponding period of 1941 while Ford's output has been 55.6 pct of the 1941 total.

Of the GM divisions, Chevrolet has made the best comparative showing during 1946, assembling 39.2 pct as many cars and trucks as were turned out in 1941 while Buick has the lowest percentage or 29.6 pct. Chevrolet's total has been boosted by its comparatively

large output of trucks.

Similarly, Dodge has made the best showing of the Chrysler divisions, producing 76.1 pct of its output during the first 9 months of this year, compared with 40.0 pct for Plymouth.

Of Ford-built cars, the Ford percentage for 1946 as compared with 1941 is 56.2; Lincoln 59.0 and

Mercury 52.4.

Obviously, the figures of completed cars do not tell the entire story. Material requirements for spare parts and replacements are roughly twice as great as for any corresponding prewar period. In addition, inventories are badly balanced which means that total steel tonnage on hand, while it may be considerably greater than in prewar years, may be entirely inadequate for the purpose of producing complete motor cars.

These are fundamental facts of automobile operations on which there is general agreement.

Probably the fairest statement of the case offered thus far is the observation that "No one has yet discovered a satisfactory way to distribute the shortage." Meanwhile, this reporter has been unable to discover any disposition on the part of automobile executives to blame the steel industry for a situation which they almost unanimously agree is largely outside the control of the steel industry. What disappoints many of them is that the steel industry does not join the automobile industry in calling attention to the bottlenecks in the flow of industrial materials which generally have their inception in Washington-OPA, CPA and other government regulatory bodies which they claim have succeeded so well in dislocating the flow of industrial materials in this country that industrial planning for the future is virtually impossible.

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The automobile industry is a carefully planned industry: increases in production as well as production curtailments have to be coordinated to the last pound of material and to every man hr. Until the time comes when automobile producers can plan their operations in advance, automobile people are undoubtedly going to be difficult to live with. As they see it, a stiff curtailment in automobile production may very easily bring with it a flash depressionsomething they would like to avoid both in the interest of the automobile industry and the steel in-

dustry as well.

New York

• • • Steel exporters branded as fantastic the theory that exports were partly responsible for the shortage of sheet steel in Detroit. Reliable sources indicate that export shipments of all steel products are currently running at approximately 6 pct of total steel produc-

The theory that American industry should continue to export prewar historical percentages to prewar historical markets is widely held by American businessmen.

The automobile industry itself subscribes to this theory as evidenced by the fact that it is currently exporting 5 pct of its products. While the steel industry would like to follow this theoretical export pattern it has been unable to come anywhere near it. It has found it impossible to do so because of past strikes, domestic pressure and government export directives and licensing requirements.

Steel exports, it is reliably reported, are currently running at about 60 pct of the prewar figure. This is the overall picture but sheet and tinplate exports are considerable below this 60-pct figure.

Shipments under CPA export allocations for tinplate are not only less than prewar but so much of the volume is going to countries with no historical record of past purchases that regular customers are said to be getting only one-third as much tinplate as they got before the war. Sheet exports are even lower, and several export sources indicate that their volume is almost at the vanishing point.

Loan of Consultants Asked by CPA to Help Solve Steel Problems

Washington

• • • Administrator John D. Small has appealed to the steel industry for loan of technical consultants over the next few months to help CPA's steel branch solve production and distribution problems concerning pig iron, steel sheet, iron and steel scrap and coke.

Speaking to the Steel Products Industry Advisory Committee, Mr. Small pointed out that priority assisted programs will require about 1,395,000 tons of steel products in the fourth quarter of 1946 or about 9 pct of the estimated 14.5 million ton production.

Programs requiring priority assistance, he said, were roughly apportioned as follows:

Housing, 326,000 tonsss; tinplate for domestic containers, 459,000; exports, including 135,000 tons of tinplate, 345,000; Schedules 1 to PR 28, 42,000; and for the armed services, 223,000 tons.

The steel industry was also asked to to help ease distribution problems by checking requirements of its customers and withholding steel shipments where it is apparent that such shipments are not absolutely necessary.

It was emphasized that the steel shortage is particularly acute on the West Coast.

Where is the Steel?

(This steel question is typical these days)

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I am attaching copy of letter which I wrote to Mr. B. of the Public Roads Administration, under date of Sept. 5, after reading the statement on p. 45 of The Iron Age dated Sept. 5. I am also attaching a copy of a reply I received from Mr. B. regarding the shortage of steel.

I would like a frank answer from you as to whether the current steel shortage may be due purely to governmental restrictions and not to the failure of the manufacturer or the fabricator to produce the product. Will you also inform me the amount of steel which may be exported to the detriment of the domestic market and whether steel is being exported under federal directive.

C. H. R.

Dear Mr. B.

Being as frank as possible I am giving you what we believe to be the basic reasons for alleged shortages of steel at the present time. Bear in mind that the word "shortage" can only be used when measured against the unprecedented demand now present, which of course is far, far above normal proportions despite the fact that production is far above past peacetime output.

(1) The present steel demand is composed of two major parts. First, the requirements are tremendous for initial supplying of steel for products that have not been made since the war started. Second, there is a demand for steel for the replacement of normal wear and tear. Both are coming in at the same time and everyone wants everything yesterday. The consequence is that the mills had to set up a quota system based on prewar buying. That is, as an old customer you may be able to get about the same percentage of the total steel made as you did in the prewar years; but in recent months quotas have been cut due to priorities and the steel and coal strikes which have lost about 1½ months deliveries this year.

(2) When the steel industry was granted an average increase of \$5 a ton in steel on Mar. 1 to partially offset the increase in wages, all products were not raised the same amount. After receiving advice from the steel industry, the OPA decided what products to advance and how much they were to be advanced. Some products were not increased as much as the steel industry claimed they should be-hence the return on these items continued, according to the steel firms, to be too low to make their own way. As a result, in order to offset rises in the costs of labor and materials, most steel companies greatly reduced the output of low-priced items and are increasing or at least concentrating on the output of those products on which the profit is great enough to keep profits returns in the black. There is now in process a study of steel prices which when completed will be furnished to OPA by the steel industry in support of its request for higher prices on items which they claim are improperly priced. Until these items are advanced it is unlikely that the supply will be expanded and it is more than likely that further declines will occur in the output of the low return steel products.

(3) In recent months the Civilian Production Administration has issued priorities for various customers engaged in housing, agricultural implement making (now dropped), and those facing hardship in reconversion as well as warehouse and export directives. At first these were not large in volume. Recently they have been heavier. This tends to upset the balance in steel distribution and consequently someone must move back in the line waiting for steel.

The amount of steel being exported today is about 6 pct of total output despite the fact that foreign countries are getting far less than they would like to have. Foreign accounts are being treated the same as domestic customers with actual shipments being based on prewar experience except in those cases where the government imposes specific directives as is now the case.—Editor.





BEHIND THE SCENES: When the quota system works, as it does, it means plenty of work for many people. Here are busy bees whom the customer never sees but who are responsible for the "mere" details falling in place.

Chicago

• • • Production planning of steel operations, as originally conceived, has had to be modified to meet present day demands. The quota system, which was subsequently evolved, in an attempt to give all customers a fair break in steel distribution, has emerged as a complex but successful system in which the mechanics of production planning are utilized. While the system has been working fairly well for some months, there is a danger that current priorities, which pay little attention to the most efficient technique of producing steel, may make the realistic working of the plan unfeasible.

The science of reaching the highest efficiency in production, by producing the required quantity of products, of the desired quality at the proper time, by the best and cheapest methods and use of manpower, is by definition and practice - production planning. This plan involves sales forecasts, market developments and a host of similar features which have had to be momentarily shelved because of the huge demand for all prodnets.

The methods of proper scheduling and operating of units, however, has been kept intact. To meet the present emergency, the quota system, which is partly based on past order volume per customer, has been brought to a

high degree of perfection. quota yardstick is not a rigid formula which can be applied in all cases and it consists mainly of the distribution of products on a geographical and customer basis.

Briefly, this means that producers periodically assemble all the available data on such subjects as forecast of sales, estimated equipment availability, order backlog report by mill unit and product, estimated shipments and so forth, and then the production planning department blends this information into a well-knit program at balanced sales distribution, efficient operating plans and satisfactory company return.

The past order volume from particular customers figure largely in what their estimated quota of steel products will be. In such cases, a base period of two or three normal operating years are often chosen as the first criterion and then modified in view of later data and current situations. This method has been adopted by a leading steel company as a system by which it can most fairly distribute present production.

Scheduling the production by large steel mills, making many diversified products, it is a hard and intricate problem. Incoming orders received by the sales department are first sent to the mill capable of making such products where the schedule clerk must first group them by specification

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and combine the tonnage into heats.

Where a full heat is not obtainable for the orders in question, inventories of semifinished stock are used, if they can be found in the proper size and specification. If no inventory is available, the full heat is made and the tonnage over and above that actually required is placed in inventory or the order is held until enough similar tonnage is accumulated to melt a full

After this planning is completed, which also includes the pouring of the proper size and type of ingots, it is again necessary for the schedule clerk to recombine the orders by sections so as to plan individual rolling on units or mills where the rolls for the section are available.

The sections must be combined to obtain maximum roll life and minimum amount of roll changing. Coordination of a great many other features are necessary at this point, as rolling practices vary with grades of steel, and further operations such as slow cooling, annealing, normalizing, pickling and oiling, and oftentimes further cold reduction may be in-

Many steel users have little conception of product mix, which means that a given plant is within narrow limits confined to certain types of steels, very precise shapes and sizes and specific tonnages per month or year. A steel producing unit melting primarily rimmed and capped steel, poured into big end down molds for conversion to bars or strip, must of necessity restrict its main efforts to such products if anywhere near capacity production is to be had. Many large mills are flexible enough to melt and pour the above mentioned grades plus fully killed hot topped ingots for conversion into slabs and sheets, but certain physical aspects establish very exact limitations which must be met by the producer.

A bar mill just can't change from 1/4 in. round to 3 in. round by "moving over" so that the bar

Tests Complex Quota System

By D. I. BROWN
Chicago Regional Editor

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comes through a different pass. Roll sets are ordered in sequence and one size is often rolled just once a week or month as the case may be. If an order is thrown out of one week's schedule, for any reason, the tonnage often times cannot be rescheduled for a month, as the finished size or grade of billets cannot be secured any sooner. The mills don't have the semifinished inventory to prolong rolling campaigns of certain sizes in different grades that they once kept for such emergency. These conditions hold true not only for bar products but all the items produced.

Another feature that requires exact timing is that the schedule man must plan production so as to make.carload shipment promptly after rolling as steel mill storage facilities are limited and available freight cars are at a premium. Undue congestion in finishing operations on finished products such as pickling, straightening cold sawing, annealing and heat treatment, can stall hot mill operations.

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Finishing operations must be scheduled the same as on any rolling unit, with one eye on the shipping platform, so that no bottlenecks can exist to hamper the overall operating rate. The chart illustrates some of the scrambling and reshuffling that must be done by schedule clerks of a mill in order to meet the many physical problems confronting a steel plant in production and shipment.

It is quite obvious that the insertion of unexpected orders into a monthly schedule, vastly complicates operations and may throw the entire program out of balance. The larger the certified tonnage becomes, the more painful the process in spite of the 30-day lead time on priority orders.

As the unplanned allocations arrive at the mill and the subsequent changes are made to insert the orders for production, previous promises on other orders, often to other customers, have to be revised. Original tonnages, which had to be moved back, must then

again be reconsidered and fitted into the next melting or rolling schedule of that particular product.

The steel industry went through a priority order period just prior to our entry into World War II. Due to the great mass of priority tonnages and the resulting confusion, the plan was scrapped and a rigid, government controlled CMP system was put into effect. The features which led to the collapse of the first priority sytsem have been summed up as follows by a leading authority on voluntary quota systems:

"Priorities are assigned to the demands of various industries or customers without a corresponding evaluation of the supply of the products available. In other words, almost before anyone knows it, the priority system can lead one to write more checks than there is money in the bank.

"Without the means of evaluating the supply side of the picture, once you are in the position of having more priority tickets than there is available supply, the next step is usually to set up a degree

of priority by establishing a sequence in which certain orders are to be filled. It is the usual experience that inevitably all ratings then start drifting toward the highest rate, leading back to the same situation that was prevalent before, when it was necessary to distinguish between different types of priorities. The net result of this to the steel manufacturer and his customer is that no delivery promise or production schedule can be set up on a reliable basis when the next mail may bring in a priority order upsetting a previous delivery promise and schedule."

This authority said further, "The dangers inherent in the priority system are present today in outstanding regulations, but fortunately to date it does not appear that CPA has granted enough priorities to come close to creating the situation that developed before." He pointed out that, "So far as the law goes, the danger is there, however, in the hands of any administrator who, for one reason or another, wishes to vigorously push the priority program."

ANOTHER CUSTOMER: Workmen on the campus at Northwestern University, Evanston, Ill., erect a group of prefabricated houses to provide shelter for approximately 1000 veteran students and faculty members. Built by Steelcraft Mfg. Co., Cincinnati, they combine structural steel and aluminum sheet.



Light Products Rise To 45 Pct of Total Steel Shipments Made

New York

• • • • Of the total tonnage of steel products shipped to customers of the steel industry in the first 6 months of this year, the proportion of the so-called "light" steel products, which are used chiefly in the manufacture of consumer goods, was higher than in any first-half year since 1939, according to the American Iron & Steel Institute.

During May of this year shipments of light products actually exceeded shipments of heavy products by a very small margin, for the first month on record.

The total of steel products shipped in the first 6 months of 1946 was approximately 22,000,000 tons. Of that steel, 9,986,000 tons or 45.4 pct, consisted of the light products, which are sheet and strip

steel, tin and terne plate, wire and wire products, black plate, conduit and light tubing.

From October 1941, to October 1945, light products accounted for less than 40 pct of total shipments. For the year 1943 the percentage of light products dropped to only 29.1 from 46.3 in 1938. The average for the first half of 1939 was 45.7 pct.

During May of this year the amount of light steel shipped was 1,953,067 tons, compared with 1,-952,997 tons of heavy products.

The total tonnage of steel products shipped in the first 6 months this year was nearly 12,000,000 tons below shipments in the corresponding part of 1945. This sharp decline was caused principally by the 1-month steel strike, the prolonged strike of coal miners and the steel industry's difficulty in obtaining ample supplies of steelmaking scrap and coke.

Deputy Administrator Of Disposal Appointed

Washington

• • • Morton M. Boyd, who recently resigned as vice-president and director of purchases for the Union Supply Co., Pittsburgh, a U. S. Steel Corp. subsidiary, has been appointed Deputy Administrator for General Disposal in WAA. He succeeds Frank R. Creedon, resigned. John S. Cooke, formerly head of Sales Group 1, Consumer Goods, has been appointed Assistant Deputy Administrator for Disposal.

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The Union Supply Co. operates 100 retail department stores located in Pennsylvania, West Virginia, Kentucky and Alabama. Although resigning his position with the company, for which he worked 29 yr, Mr. Boyd still remains a member of the company's board of directors.

			CAPA	CITY, PRODUC	TION AND	SHIPMENTS				Period AUGUST	- 1946
	1	Current Month				To Date This Year					
Steel Products			Maximum Annual Potential Capacity	Production		Shipments (1	Net Tons)	Production		Shipments	(Net Tons)
Steel Products	Number	Items	Potential Capacity Net Tons	Net Tons	Per cent of capacity	Total	To members of the industry for conversion into further finished products	Net Tons	Per cent of capacity	Total	To members of t industry for cor version into furth finished product
ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	40	1		****	xxx	405,295	175,476	XXXX	XXX	2,235,611	1,020,46
Structural shapes (heavy)	12	3	9,421,550	347,540 23,443	46.3	350,609 27,874	****	2,065,107	34.9	2,080,202	****
Plates (sheared and universal).	29 5	4 5	17,080,770	445,168	30.7	451,275 50,344	30,275 18,744	2,640,986	23.2	2,616,529	177,1
Rails-Standard (over 60 lbs.)	4	6	3,657,000	202,261	65.1	199,322	XXXX	1,070,881	44.0	1,035,530	XXXX
-All other	5_	7	392,000	14,514	43.6	17,312	XXXX	93,155	35.7	95,204	XXXX
Splice bars and tie plates.	13	8	1,745,960	65,733	44.3	71,013	EXXX	387,661	33.3	411,289	XXXX
Track spikes	11	9	349,400	13,082	44.1	13,633	xxxx	85,937	36.9	90,996	XXXX
Hot Rolled Bars-Carbon	34	10	XXXX	733,360	XXX	578,320	77,034	* 4.255.852	XXX	#3,470,791	# 450,9
-Reinforcing-New billet	15	11	EXXX	99,709	XXX	107,273	BEEE	585,893	***	637,330	ERXX
-Rerolled	12	12	XXXX	11,880	xxx	12,762	XXXX	89,434	XXX	89,792	XXXX
-Alloy	23	13	XXXX	187,818	XXX	163,305	12,920	1,050,329	xxx	89,792 * 873,935	80,7
-Total	40.	14	22,329,660	1.032.767	54.4	861,660	89,954	* 5,981,508	40.2	+5,071,848	# 511,7
Cold Finished Bars—Carbon	24	15	XXXX	129,690	XXX	123,938		* 808,037	XXX	# 802,920	XXXX
-Alloy	23	16	xxxx	21,162	xxx	20,011	xxxx	141.061	xxx	# 125,834	XXXX
Total	31	17	2.851.510	150,852	62.3	143.949	XXXX	# 949.098	50.0	* 928,754	XXXX
Tool steel bars	17	18	255.010	9,501	43.9	9,121	XXXX	68,397	40.3	* 68.076	XXXX
Pipe & Tubes—Butt weld	14	19	2,176,520	150,238	81.2	133,581	xxxx	862,923	59.5	821,354	XXXX
—Lap weld	9	20	730,200	33,566	54.1	34,944	xxxx	175,004	36.0	190,248	****
-Electric weld	10	21		79,629	61.0	72,547	EXXX	477,384	46.6	408,336	****
—Seamless	13	22	1,536,900		87.3			1 359 187	64.3		EXXX
-Conduit (cap. & prod. incl. above)	6	23	3,169,600	235,093	2 X X	206,798	XXXX	1,358,157	XXX	1,196,719	***
-Mech, tubing (cap. & prod. incl. above).	12	24	XXXX	XXXX	xxx	10,937	XXXX	XXXX.	***	57,949 271,584	XXXX
Wire rods		25							-		# 225.0
Wire-Drawn	26 41	26	7,293,670	442,128	71.3	100,607	32,452	* 2,728,517	56.2	* 646,834	88,3
-Nails and staples	19	27	5,742,890	362,773	74.4	211,418	14,100	* 2,160,644	56.5	*1,248,893	X X X X
-Barbed and twisted	16	28	1,260,360 543,610	60,685	56.7	58,291 18,50	****	365,325 134,763	43.5 37.2	364,004 132,762	2222
Woven wire fence	16	29	345,010			10,50	XXXX		31.5	243,185	***
Bale ties.	13	30	1,121,860	36,186 9,641	75.8	35,317 9,826	XXXX	243,463	32.6 56.1	58,713	XXXX
								55,915	XXX		1,3
Black Plate—Ordinary	8	31	NEE COO	XXXX	XXX	63,99		NXXX		474,954	XXXX
—Chemically treated	9	33	465,000	9,493		11,638		85,569		83,846	-E.E.E.E
Tin and Terne Plate—Hot dipped —Electrolytic.	9	34	3,758,850	181,288		202,913		1,155,293	46.2	1,244,074	***
			2,231,850	91,765	48.4	91,837		568,413	38.2	580,859	
Sheets—Hot rolled.	31.	35	19,785,320	1,362,903	81.1	640,926	49,389			3,786,001	260,0
—Cold rolled	14.	. 36	7,309,460	543,147	87.5 52.8	385,327 139,462	XXXX	3,404,181	69.9	2,449,338	XXX
—Galvanized	16.	. 37	2,924,130					900,959		920,873	XXX
Strip—Hot rolled	25 34	. 38	7,180,030	260,559 133,151	42.7	166,98		1,500,366		942,882	* 157,
—Cold rolled		. 39	3,067,450			124,170		* 826,323	40.5	* 804,919	XXX
Wheels (car, rolled steel)	5	40	207,700	26,206		28,02		151,656		155,829	XXX
Axles		41	398,170	14,482		14,147		80,410		77,510	XXX
All other	3	42	2071724	4,149		516		28,173	25.0	3,580	XXX
TOTAL STEEL PRODUCTS	1742	. 43	XXXX	. zzzz	XXX	5,406,470	01 441,014	xxxx	IXXX	32,154,914	1 2,555.
Effective steel finishing capacity	142	_ 44	6h 6h8 coo	XXXX	ZZZ	XXXX	XXXX	'xxxx	XXX	XXXX	XXX
Percent of shipments to effective finishing capacity	142			XXXX	XXX	90.4%		XXXX	XXX		

^{*} Adjusted.

Weekly Gallup Polls . . .

Public Calls for Removal of Price Control on Meat

Princeton, N. J.

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••• The public's faith in price control has declined sharply in the past 5 months, according to George Gallup, director, American Institute of Public Opinion.

The majority of voters last May wanted OPA price ceilings kept on food, clothing and manufactured products. Today those controls are far less popular. Meat, especially, is an item which voters from coast to coast think should be decontrolled.

The one ceiling which continues overwhelmingly popular is rent control.

The changing attitude of the public toward OPA can be seen by comparing the results of two institute surveys, one reported in late May and the other just completed.

The vote in the more recent poll is given first.

"Do you think the present price ceilings should be kept on or taken off the following items?"

items?"			
1	Kept	Taken	No
	on	off	opinion
	Pct	Pct	Pct
Meats	42	53	5
Other foods	42	51	7
Clothing	49	44	7
Autos, radios and			
other goods	45	46	9
Rents	67	27	6

The poll last May dealt with the same items, except for meat.

"For the next year would you like to have OPA price ceilings kept on or taken off the following?"

k k	(ept	Taken	No
	on	off	opinion
	Pct	Pct	Pct
Food	75	21	4
Rent	78	17	5
Clothing	70	26	4
Autos, radios and			
other goods	66	27	7

It will be noted that whereas in May anywhere from two thirds to four fifths of the voters wanted controls kept on the various items, today less than half believe controls should remain on anything except rents.

Political leaders in both parties have indicated that meat, or the lack of it, may play an important part in this year's congressional election.

The current poll does find some difference of opinion among Re-

publican and Democratic voters as to whether present meat price ceilings should be kept on or taken off. In general, Democratic voters favor keeping them on, while Republicans are opposed.

The vote by political parties, and by major occupation groups, fol-

M	leat Cei	lings	
	Kept on Pct	Taken off Pct	No opinior Pct
Republicans Democrats Professional and		67 42	6
business		59 60	4
White collar. Manual workers	41	54 47	5

• • • The United States not only has the lowest voter turnout at elections of any major democracy, but comparatively few Americans take the trouble to inform themselves on basic political facts.

This November the country will, for the eightieth time in its history, elect a House of Representatives, yet fewer than half the voters of the nation are correctly informed about so elementary a matter as the term of office of a member of the House.

Literally millions of people thin's each representative is elected to serve for a 4-yr term, other millions confess that they do not know how long the term is, despite the fact that it is stated in the Constitution and has not been changed since that document was adopted nearly 160 yr ago.

Every teacher of civics, history or political science in the United States will be interested in the following poll conducted among a true cross-section of the voting population from coast to coast.

"When a man is elected to the U. S. House of Representatives, how many years does he serve in one term of office?"

The replies:

47 pct correctly replied "2 yr." 53 pct did not know or gave an incorrect answer.

Most of the incorrect answers were "4 vr."

Educators may find especially

U.S. Voters III Informed On Elementary Political Facts. Dewey Leading Mead in Poll

shocking the lack of information on this point among people who have had college training.

The replies in the poll according to extent of formal education which the voter has had are as follows:

	Correct (2 yr) Pct	Don't know or incorrect Pct
College	75	25
High School		45
Grade		
School or no School	36	64

Other polls in the past have found that only one voter in four knows how much salary a representative gets. And in January of this year an institute survey found that only 27 pct of the electorate was aware that a congressional election was to be held in 1946.

Students of government have long felt that the term of office of a member of the House of Representatives should be changed from 2 yr to 4 yr. They claim that members of the House are so harassed having to think about reelection every 2 yr. and must be so responsive to political pressures if they want to get reelected, that they cannot devote sufficient attention to serious work. The proponents of a 4 yr term claim that this innovation would allow congressmen greater freedom to serve the best interests of the country.

Latest to make the 4 yr term proposal is Senator Carl A. Hatch of New Mexico, who advocates a Constitutional amendment to make the change.

Among voters who know correctly what the term of office is now the reaction to the proposal is as follows:

"It has been suggested that the Constitution be changed to make the term of office of Congressmen in Washington 4 yr

(CONTINUED ON PAGE 175)

AMERICAN IRON AND STEEL INSTITUTE

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Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1946

Based on Reports by Companies which in 1945 made 97.6% of the Open Hearth, 100% of the Bessemer and 85.8% of the Electric Ingot and Steel for Castings Production

		Estimated Production—All Companies							Calculated	
Period	OPEN HEA	ARTH	BESSEN	BESSEMER		RIC	TOTA	AL	weekly production.	Number of weeks
	Net tons	Percent of canacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		in month
Tanuary	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
February		20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
March		86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st Quarter	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367	12.86
April			286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
May	3,699,979		153,409	35.0	219,064	46.9	4,072,452	52.2	919,289	4.43
June		77.0	251,253	59.2	227,979	50.4	5,624,826	74.4	1,311,148	4.29
	14,178,712	69.9	690,750	53.7	688,074	50.1	15,557,536	67.9	1,195,814	13.01
	24,954,444		1,288,116	50.4	1,086,594	39.8	27,329,154	59.9	1,056,403	25.87
July	6,016,253	87.4	365,332	83.6	228,083	48.9	6,609,668	84.9	1,495,400	4.42
	6,251,271	90.6	373,837	85.4	261,755	56.0	6,886,863	88.2	1,554,597	4.43
September	5,914,769	88.7	371,465	87.8	230,978	51.2	6,517,212	86.4	1,522,713	4.2
3rd Quarter	18,182,293	88.9	1,110,634	85.6	720,816	52.0	20,013,743	86.5	1,524,276	13.1
	43,136,737		2,398,750	62.2	1,807,410	43.9	47,342,897	68.9	1,213,920	39.0
October										4.4
November	**********									4.2
December	*******									4.4
4th Quarter										13.1
2nd 6 months	IS									26.2
Total		-								52.1

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

* Revised. † Preliminary figures, subject to revision.

YEAR 1945

Based on Reports by Companies which in 1945 made 97.6% of the Open Hearth, 100% of the Bessemer and 85.8% of the Electric Ingot and Steel for Castings Production

		Estimated Production—All Companies								
Period	OPEN HE	OPEN HEARTH		BESSEMER		ELECTRIC		L	*Calculated weekly production,	Number of weeks
	*Net tons	*Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	*Percent of capacity	all companies (Net tons)	In mont
January	6,469,340	90.5	379,062	76.0	355,910	76.8	7,204,312	88.8	1,626,256	4.43
	5,968,326	92.4	347,227	77.1	337,212	80.6	6,652,765	90.8	1,663,191	4.00
March	6,927,939	96.9	398,351	79.8	379,639	81.9	7,705,929	95.0	1,739,487	4.43
1st Quarter	19,365,605	93.3	1,124,640	77.6	1,072,761	79.7	21,563,006	91.5	1,676,750	12.86
April		94.5	372,952	77.2	375,308	83.6	7,289,887	92.8	1,699,274	4.29
May	6,664,117	93.2	402,100	80.6	383,450	82.7	7,449,667	91.8	1,681,640	4.43
June	6,129,763	88.5	379,807	78.6	330,952	73.7	6,840,522	87.1	1,594,527	4.29
2nd Quarter	19,335,507	92.1	1,154,859	78.8	1,089,710	80.0	21,580,076	90.6	1,658,730	13.01
1st 6 Months	s38,701,112	92.7	2,279,499	78.2	2,162,471	79.9	43,143,082	91.0	1,667,688	25.87
July		88.6	381,832	76.7	284,764	61.6	6,985,571	86.3	1,580,446	4.42
	5,172,344	72.3	347,088	69.5	215,885	46.6	5,735,317	70.7	1,294,654	4.43
September	5,435,799	78.7	352,847	73.2	193,829	43.3	5,982,475	76.3	1,397,775	4.28
3rd Quarter.	16,927,118	79.9	1,081,767	73.1	694,478	50.5	18,703,363	77.8	1,424,475	13.13
9 months	55,628,230	88.4	3,361,266	76.5	2,856,949	70.0	61,846,445	86.6	1,585,806	39.00
October	5,146,787	72.0	242,122	48.5	207,867	44.8	5,596,776	69.0	1,263,381	4.43
November	5,641,308	81.5	358,664	74.2	200,494	44.7	6,200,466	78.9	1,445,330	4.29
December	5,523,277	77.4	343,266	68.9	191,394	41.4	6,057,937	74.8	1,370,574	4.42
4th Quarter	16,311,372	76.9	944,052	63.8	599,755	43.6	17,855,179	74.2	1,358,842	13.14
2nd 6 months	33,238,490	78.4	2,025,819	68.5	1,294,233	47.1	36,558,542	76.0	1,391,646	26.27
Total	71,939,602	85.5	4,305,318	73.3	3,456,704	63.4	79,701,624	83.5	1,528,608	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,614,338 net tons open hearth, 112,658 net tons Bessemer and 104,640 net tons electric ingots and steel for castings, total 1,831,636 net tons; based on annual capacities as of January 1, 1945 as follows: Open hearth 84,171,590 net tons, Bessemer 5,874,000 net tons, Electric 5,455,890 net tons, total 95,501,480 net tons.

*Revised January through December, 1945.

Amends Definition Of New Producer of Cast Iron Pipe and Fittings

Washington

••• Effective Oct. 10, NHA has defined a "new producer" of cast iron soil pipe and fittings as related to the Premium Payments Regulation 8. The amended definition states that a producer whose new plant was "substantially completed" at the time the regulation was issued shall not be considered a new producer with respect to that plant.

The Veterans Emergency Housing Act of 1946, which authorized the funds for premium payments, specifies that the premium payments shall not be applied to more than 50 pct of the dollar value of a new producer's output.

Amendment of the definition, NHA said, will permit those producers of cast iron soil pipe and fittings whose plants were nearing completion on the effective date of the Premium Payment Regulation to come outside the "new producer" category and thus have their quotas established administratively by the Housing Expediter without the 50 pct restriction.

The amended defition of "new producer" in Regulation No. 8 will thus conform with the definition in Regulation No. 9, which covers the merchant pig iron industry, NHA said

Planemakers May Build Prefabricated Houses

Washington

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• • • A distinct probability of the entrance of airplane manufacturers into the housing field by production of prefabricated aluminum houses under guaranteed market contracts is seen here following the return of Housing Expediter Wilson W. Wyatt from an extended field trip including West Coast points.

Much of the visit was occupied by conferences on the subject with leading aircraft manufacturers. While NHA officials declined to identify the firms with which contracts may be negotiated it was learned that the firms visited included Consolidated, Goodyear, Douglas, McDonnell, Glenn Martin and Howard Hughes.

Despite NHA optimism several difficulties stand in the way of assembly line production. One of

these is a scarcity of aluminum, now being produced at little more than two-thirds capacity of which nearly half or about 400 million lb is sought for housing needs. Another difficulty is the lack of soda ash for stepping up aluminum production.

Housing officials decline to predict when manufacture of prefabs on the aircraft assembly lines will begin other than it will be "in the near future." Plane manufacturers however will take on the prefabs only as a sideline and to the extent that it will not interfere with plane-building activities.

Merchant Iron Makers May File Until Nov. 15

Washington

• • • Because of delay in printing of the necessary forms, NHA has extended for 30 days the time in which producers of "Merchant" pig iron may file certifications in connection with bonuses they pay to producers of basic iron during September. This action extends the time for such filing to Nov. 15. "Merchant" iron as defined by NHA includes only malleable and foundry grades.

The amended regulation was announced on Oct. 14 and provides that if a merchant pig iron producer reduces his shipments of steel making grade pig iron in order to increase his production of merchant pig iron, he may pay any producer of steel grades a bonus of \$2 a ton for taking over his orders for such grades. He must file with the Housing Expediter a certification regarding the transfer by the 15th day of the month following shipment of such transferred orders.

WAA Approves Plant Sale

Washington

• • • Sale of an aluminum ingot and forging plant at Monroe, Mich., to the Kelsey-Hayes Wheel Co., Detroit, for \$2,450,000 cash has been approved by WAA. The plant was operated by the Aluminum Co. of America during the war and cost the government \$6,203,000. WAA said that most of the equipment is unsuitable for steel fabricating operations such as Kelsey-Hayes is engaged in. Under the terms of the sale, WAA is to remove within 90 days any equipment and machinery not

Hits Black Market

Washington

• • • Charging widespread violations of ceiling prices in the resales of iron and steel products, OPA has announced that it will vigorously prosecute all violations which it uncovers among buyers and sellers. While no specific violators were named, the agency said it

While no specific violators were named, the agency said it had filed suits totaling \$300,000 in Detroit alone. Most of the violations, OPA said, involved sales of surplus or excess stocks although some direct mill shipment violations are involved. Persons buying for their own use and then selling the excess become sales principals and are bound by prices listed in RPS-49, the agency emphasized.

the agency emphasized.

Neither charges for finding nor commissions for assistance in transactions may be added to the ceiling prices, it was also pointed out.

needed by the buyer, who is to take partial possession within 30 days from the date of the sale.

Appointed to WAA Staff

Washington

• • • Robert M. Field, New York lawyer, has been appointed Vice-Administrator for Staff Operations of WAA.

Mr. Field, who has been an officer and director of various subsidiaries of the U. S. Steel Corp., is now in charge of the following WAA Washington offices:

Plans and policies, liaison with owning agencies, general counsel, information and advertising, fiscal services, personnel and office services, acquisitions, general disposal, aircraft disposal, real property disposal and general review.

Antimony Imports Curbed Washington

• • • Antimony ores, concentrates, metals and alloys have been added to the list of materials subject to CPA's General Imports Order (M-63), thus bringing antimony ore and metal back under import control.

This action was taken in order to restrict importation of ore concentrates or low-grade metal intended for refinement and subsequent export of the resultant products, CPA explained, which would disrupt the RFC purchase program.

Sees India as Future Market for Imports Of U. S. Machine Tools

Cleveland

• • • Heralding the emergence of India as a future market for U. S. machine tools, Sankalchand



S. G. Shah

president of the All-India Manufacturers' Organization, recently discussed plans for importing machines to augment India's present machine tool production with machine tool builders here.

G. Shah, vice-

According to Mr. Shah, who would like to have U. S. machine tool builders establish plants in India in cooperation with Indian industrialists, only America will be satisfying India's ultimate demand for machine tools. The machine tool industry in India, which is 5 yr old, is now producing about 500 units a year, he said.

Mr. Shah, who was in England looking at British machine tools prior to his arrival in America, prefers U. S. machines to British, which he considers "quite good" although the prices of U. S. machines seem quite high in comparison to prices of British units.

Mr. Shah has inspected the U. S. and British government-owned machine tool surpluses as possible sources of supply, with poor results. He found most of the British surplus has been sold, and most of the machines he selected tentatively from War Assets Administration stocks in this country were not available for one reason or another. He will take another look at the British surplus on the way home.

Size of the orders Mr. Shah will place with U. S. machine tool builders depends a great deal on the rate of dollar exchange the government will make in the next few months. If all factors are favorable, initial orders may be for a total of "about 500 machine tools," he admitted. Mr. Shah is interested mainly in standard, general purpose equipment, including universal milling machines, grind-

ers, shapers, and some automatics.

He conferred with officials of National Acme Co., Warner & Swasey Co., Motch & Merryweather Machinery Co., and others here, and Cincinnati Milling Machine Co. and Cincinnati Shaper Co. in Cincinnati. He will visit firms in the New York area next.

Mr. Shah, who owns and operates six manufacturing firms in Bombay and is a director of 30 other companies, feels imports to India will increase greatly as a result of the new Indian government's open door policy, with license to import and dollar exchange.

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House Monopoly Group To Call Off Hearings

Washington

• • • • The Monopoly Subcommittee of the House Business Committee has canceled hearings on what it called the growth of economic concentration. The hearings had been scheduled to begin Oct. 15. This unexpected action was announced by Chairman Estes Kefauver, D., Tenn. He said the hearings had been called off because of the inability of the members of the subcommittee to devote sufficient time during the remainder of the year "to do justice to the subject."

These hearings were to have been a full dress affair and had created a great deal of interest particularly because of reports by the Federal Trade Commission and the Dept. of Justice in their antitrust activities. Included in these reports are attacks on the basing point system.

This and other material submitted to the subcommittee will be presented to Congress by the end of the present year in a preliminary report, Mr. Kefauver said. This report, it is stated, will consist almost entirely of the government view with little if any of the position of so-called big industry being presented.

Baker Gives Up Price Post

Washington

• • • Resignation of Geoffrey Baker as Deputy Administrator for Price and the appointment of C. Dan McNeal to that position, effective Oct. 18, has been announced by OPA Administrator Paul Porter

Coming Events

Oct. 23-25 Porcelain Enamel Institute, French Lick, Ind.

Oct. 23-26 National Tool & Die Manufacturers Assn., convention, Chicago.

Oct. 28 American Institute of Steel Construction, convention, Coronado, Calif.

Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.

Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.

Nov. 7-8 National Founders Assn., New York.

Nov. 15-24 National Aircraft Show, first annual exposition, Cleveland.

Nov. 17-22 American Welding Society, Atlantic City, N. J.

Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.

Dec. 2-4 Society of Automotive Engineers, air transport meeting, Chicago.

Dec. 2-7 National Power Show, New York.

Dec. 5-7 Electronic Microscope Society of America and American Society for X-ray & Electron Diffraction, joint meeting, Pittsburgh.

Dec. 5-7 Electric Furnace Steel Committee of Iron & Steel Div., American Institute of Mining & Metallurgical Engineers, annual conference, Pittsburgh.

Dec. 9-11 Society for Experimental Stress Analysis, New York.

Jan. 6-8 Institute of Scrap Iron & Steel, Inc., convention, New York.

The London ECONOMIST

Fleeting Opportunity

HE prospect of the world after 1 yr of so-called peace would break the heart of an archangel, and it says something for the remaining sanity of mankind that in the last week an American, a British and a Russian voice have made themselves heard in conciliatory speech, very different from the tone of obduracy and suspicion now inevitably associated with Molotov, Byrnes and Bevin. voices varied in influence and political background. In Britain it belonged not to any "crypto-Communist" but to one of the leaders of the Conservative Opposition, Mr. Eden, who made an eloquent appeal for a better spirit of understanding and a new attempt to make Allied cooperation the fact it was during the war. In America, too, it was in a sense the leader of an opposition who spoke, for Mr. Wallace has paid for his plea for a new approach to Russia by losing his seat in the Cabinet.

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But the most significant and, possibly, the most hopeful reversal of the recent trend towards open hostility has come from Marshal Stalin himself. In an interview to the correspondent of the Sunday Times, he reversed almost every recent line in Soviet propaganda by stating that he did not believe "capitalist encirclement" to be either possible or intended, that there was no menace of atomic war and that the atomic bomb might be prohibited and that communism and capitalist democracy could live

peacefully side by side.

What does this coincidence of speeches amount to? Only one voice - Stalin's - speaks with authority. Eden and Wallace have only registered a widespread and profound uneasiness at the bludgeoning tactics of their nation's official spokesmen. But at least the fact that for a brief time the spell of universal ill-will has been weakened, however slightly, makes the occasion a suitable and reasonable one for a reassessment of the relations between the Great Powers and

for an attempt to recapitulate one or two of the steps by which they could, if they would, draw back from the brink of disaster.

NE general point must be made clear. As Eden pointed out in his speech, the restoration of the international situation cannot be the work of any one Great Power. All have helped to create the present impasse. All must work for a better understanding. And, if the principal aim of the Powers is to restore a measure of cordiality, the allotting of degrees of blame must for a time be set aside. The fact that one Power may be more responsible than the others for the present deplorable state of their relations is less important than the disaster towards which they will all head, if they allow the situation to drift.

An obvious first step on the agenda of conciliation should be to mitigate the present tendency of international society to become divided into two mutually exclusive and hostile blocs, and it is here that Great Britain and France carry the primary responsibility. It is a remarkable fact — and one which Bevin would do well to considerthat on this point spokesmen widely diverse in their political approach and newspapers representing as wide a variety of outlook have spoken in almost identical terms. They argue that the most immediate and most useful way in which Great Britain can help to break the ideological deadlock is by pursuing in certain fields policies distinct from those connected with Byrnes. and in particular by seeking closer understanding with France, the other Great Power with most to lose as a result of the present extreme polarization between communism and capitalist democracy. The closer association of Britain and France, it is argued, could help to prove that Europe need not be divided between two hostile, external Great Powers, and that methods of economic and political associaReprinted by special permission to further understanding on how political and economic affairs are viewed in London.

tion exist which lie between the extremes of exclusive state trading and unfettered free enterprise.

Two immediate steps suggest themselves. As a result of the recent Franco-British trade agreement, experts from both countries are to meet at regular intervals to coordinate the two countries' economic and commercial policies and to attempt to make them complementary rather than competitive. On how ambitious a scale will this modest beginning be developed? What interests in the industrial field are the Treasury, the Board of Trade and the Foreign Office consulting to give concrete content to the notion of "complementary development?" The Belgians and the Dutch have adopted certain procedures in their negotiations for a customs union. Is there any reason why the British and the French should not set their sights equally high and profit by the others' experience?

ANY factual discussion of eco-nomic cooperation will bring the British and the French-as it has already brought the Lowlanders — up against the problem of Germany's economic future, and it is well to recall that the biggest obstacle to close Anglo-French understanding still remains the Ruhr. So far the French have, through a variety of mouthpieces, stated their political views on the Ruhr's final status. The British have on their side worked out a plan for a form of international economic control. What has not been achieved is any attempt to set up a joint board of (CONTINUED ON PAGE 176)



• H. H. Pease: Newly elected president of the NMTBA.



• A. G. Bryant: Newly elected first vicepresident.



• L. D. McDonald: New second vice-president of group.



• Louis Polk: Newly elected treasurer of the NMTBA.



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H. L. Tigges: Elected to board of

Says Machine Tool Prices May Soon Be Decontrolled

Quebec

• • • Decontrol of all machine tool prices may be effected by November, or at the latest by December, according to Phil Huber, president, Ex-Cell-O Corp. Speaking before more than 300 members of the National Machine Tool Builders' Assn. at their 45th annual meeting in Quebec recently, Mr. Huber reminded them that only those machines having a weight of 2000 lb or less are still under control, and expressed the belief that the industry is now on the last lap of price control. OPA, he said, is still mystified as to why the builders have not taken full advantage of the 20 pct increase granted last spring, and warned that the anticipated removal of control will be only a suspension, and that if there should be any disproportionate price increases, control can be reinstated.

With a record attendance both of members and their ladies, the meeting was held at the Chateau Frontenac, Quebec, and while some pessimism was expressed concerning foreign markets, the feeling on the whole appeared to indicate that conditions were improving steadily and that machine tool production during the coming year should be near normal.

New officers elected for the year 1946-1947 were: President, Herbert H. Pease, president, New Britain-Gridley Machine Div., New Britain Machine Co., New Britain, Conn.; first vice-president, Alexander G. Bryant, vice-president, Cleereman Machine Tool Co., Chicago; second vice-president, L. D. McDonald, vice-president, The

Warner & Swasey Co., Cleveland; treasurer, Louis Polk, president, The Sheffield Corp., Dayton. H. L. Tigges, vice-president and sales manager, Baber Bros., Inc., Toledo, was elected to the board of directors.

Retiring president William P. Kirk, in his annual address, charged that after VJ-Day, when everybody said the need was for production and still more production, the United States fell down on the job.

The fact is, Mr. Kirk said, that although we talked productivity, what we really did was to put every obstacle we could think of in the path of production accomplishment. Through renegotiation and excess profits taxes, industry was deprived of reserves which they needed for financing reconversion, redesign and expansion for peacetime products. In the case of hundreds of items, price control regulations stopped production cold. Strikes and slowdowns knocked an incredible volume out of our production totals. And finally, he said, the supply of basic materials was messed up still worse by adding the red tape of government control to an already hopelessly muddled picture.

If economic planners had stayed up nights for weeks trying to figure out how thoroughly they could sabotage the American postwar production program, I don't know how they could have done a more complete job, Mr. Kirk stated.

Most of the blame, Mr. Kirk asserted, belongs on the doorstep of government and leaders of organized labor. Government, Mr. Kirk said, has followed a policy of ap-

peasement and union leaders have deliberately fostered, in many cases, schedules of limited productivity. Until we can get a fair measure of productivity, he added, prices will continue to go up in proportion to wages or even more; and the inflation cycle will continue; the scarcities and the black markets will be universal; and we will wind up in a national economic collapse.

James Y. Scott, president of the Van Norman Co., Springfield, Mass., and chairman of the government relations committee of the National Machine Tool Builders' Assn., reported that up to July only a little over one-fourth of government-owned machine tools had been sold as war surplus.

Machine tools to the original value of \$954,537,000 have been declared surplus, Scott said, and it is thought that this is over 90 pct of the eventual total. Of these, machine tools to the original value of \$257,000,000 have been sold.

We feel that this enormous supply of machine tools, mostly of recent manufacture, should be put to work in the metalworking plants of the United States as quickly as possible to replace some half-million obsolete machines still in use. The results so far are very disappointing. Red tape, confusion and delay have been characteristic of the operation.

In spite of all our effort, Scott asserted, in spite of directives, in spite of statements of policy, practically no machines have gone to the schools. Never have so many expressions of noble interest been so barren of results. First, they

were to have a 40 pct discount. Then they were to be allowed to take machines that could not be sold commercially and which would otherwise be scrapped. Now the thinking is to charge a school 6 pct of the original price which is supposed to cover handling costs. The schools who most need the machines can't pay 6 pct. The Attorney General has ruled that the WAA can legally give surplus to nonprofit educational institutions under the Surplus Disposal Act as amended, but the machine tools are not going to the schools. We have long urged a proper reserve of idle machine tools to be held by the armed forces, he said. Unfortunately, the last session of Congress passed a law prohibiting the transfer of property from one branch of the government to another without payment. The armed services want these reserves, but only one or two departments acted quickly enough to secure any before the passage of that act. The entire reserve of all the armed services, not including machines installed in arsenals and yards, is probably less than one month's output of the industry at wartime

Referring to the intent of the War Assets Administration to scrap certain machine tools declared commercially unsalable, Scott said: "In the face of a decidedly uncertain international situation, we are destroying part of our war potential that just does not exist in our shops in times of peace, that cannot be hastily improvised or commandeered. know better than anyone how desperately hard it is to get such machines fast enough in time of war. They should be reserved by the armed services and the best of them stored."

To Sell \$350 Million Machine Tools on Cut Price Basis

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• • • Despite opposition of the machine tool industry, a new pricing program which removes from 60 to 70 pct of all government-owned machine tools from under the Clayton formula and places about \$350 million worth on sale immediately on a lower fixed price basis has been announced by WAA Administrator Robert M. Littlejohn.

The current WAA inventory stands at about \$690 million. It is roughly estimated that another \$600 million worth remains to be declared as surplus.

At the same time, official sources disclosed that within a few days RFC would issue an order canceling all lessee contracts for some 140,000 machine tools which are presently owned by the government, but which have been in interim use since VJ-Day by purchasers or lessees of surplus war plants.

This is the first confirmation of such intention although the action has been widely rumored over past weeks. Thus, the RFC action will mean another shake-out in surplus by forcing present users to either exercise their options to buy or release the tools for sale as surplus. It is believed here that a large number will exercise their options, thereby reducing the quantity of surplus remaining to be disposed of by WAA.

Primary purpose of changing over to a fixed price basis is to speed the disposal of slow sellers and those in long supply, Mr. Littlejohn said. Although the cost recovery rate has been high, almost 50¢ on the dollar, only \$260 million worth (acquisition cost) has been

By KARL RANNELLS
Washington Bureau

disposed of during the first half of 1946. At the same time, the inventory has been increasing.

Of this amount, approved dealers were responsible for some \$83 million worth for which the return was \$40 million. There are now approximately 3000 approved dealers who receive a 12½ pct commission on all sales.

Under the new pricing method, the WAA expects to get the following results: Encourage manufacturers to replace worn or obsolete equipment with newer and later designs; assist small business, particularly veterans who are establishing businesses of their own, in obtaining equipment immediately for their needs; and, to provide equipment for rebuilders and manufacturers to rebuild production equipment and machinery for both domestic and export sales.

Although consisting mainly of general purpose, high production machine tools, there will be some specialized nonstandard tools included in the fixed-price list, thus making it possible for many shops to acquire specialized equipment which can be altered for general purpose use at low cost, WAA said.

The large inventory will be disposed of through the 33 WAA regional offices and approved dealers. Catalogs containing listings which include the brand, type, description, price and code number will be available at the WAA regional

offices or through approved dealers.

Mr. Littlejohn said that this action has been taken in accordance with recommendations made by the Machinery & Allied Products Institute. He said MAPI President William J. Kelly, wrote that:

"If all standard machinery and equipment were generally offered to purchasers at a fair price, a considerable volume would move expeditiously into the hands of private owners with a minimum of red tape on the part of buyers and the government. Such general offering should be made through pricing under appropriate formulas by naming fixed prices adequately reflecting current values."

The Clayton formula will continue to apply to the remaining 30-40 pct of machine tools not listed in the catalog. It was pointed out that the catalog price will prevail in all of the regional offices and that prospective purchasers may visit WAA warehouses or plants where the machines are located to inspect, purchase and arrange for delivery.

Offered for sale on the fixed-price basis are the following general categories of tools:

Boring machines; chucking machines; drilling machines; drill presses; gear cutters, hoppers and shapers; gear tooth shavers and grinders; crank pin grinders; centerless, external, internal and surface grinders; thread grinders; multiple and turret lathes.

Also, plain bed, profile, thread and vertical milling machines; polishing and buffing machines; and, vertical, single or multiple tapping machines.

Details Rise and Fall of Japanese Industrial Empire

London

• • • Three quarters of a century ago the industrialization of Japan started from scratch. Her first Western-type blast furnace was not blown in until 1901. In 1917 her crude steel output was three quarters of a million metric tons. In 1926 it had reached a million and a half tons. And by 1943, according to a recent report from the Supreme Commander for the Allied Powers, the steel ingot production of the Japanese Empire reached a peak of 9,656,000 tons, of which 8,616,000 tons were produced on the home islands.

On June 12 this year, it was reported that the Far Eastern Commission had recommended that Japan's production should be limited to 3.5 million metric tons of ingots and 2 million tons of pig iron.

Even greater curtailment is desired by the National Engineers' Committee appointed by the Engineers' Joint Council, in a 7-point program on Japanese industrial rearmament submitted to the State, War and Navy Depts., proposing that Japan's wartime peak of iron and steel production of over 9 million tons should be cut by more than 80 pct. They estimate postwar requirements of rolled products at 1.6 million tons, involving a total steelmaking capacity of 2.5 million ingot tons, which they suggest should be concentrated for the most part in three or four of the most efficient openhearth plants operating in close proximity to blast furnaces and rolling mills.

Of the 3 million tons of electric furnace capacity remaining at VJ-Day, they propose that 350,000 tons should be left, sufficient for a production of 230,000 ingot tons. This would leave some 2.75 million tons of electric steelmaking capacity available for reparations or destruction.

For alloying purposes a recommendation is made for the supply of 3000 to 3600 metric tons for contained chromium, 1000 to 1500 tons of nickel, and a few hundred tons of molybdenum, vanadium

Credit Dr. Brewin

London

• • • This report on the Japanese steel industry was prepared in London for the Monthly Statistical Bulletin of the British Iron & Steel Federation, and an abstract of it was published in the August issue of that publication. It was prepared by Dr. E. Brewin, of the Federation.

and tungsten. The allowable steel tonnage, states the report, would require 21,000 metric tons of 75 pct ferromanganese and 6200 tons of 50 pct ferrosilicon.

Pig iron production they propose should be limited to 1.5 million tons annually (i.e. about 65 pct of the permissible ingot tonnage), plus 50,000 tons of foundry iron for castings. But if in practice the home supply of steel scrap proved more than sufficient for the 2.3 million tons of ingots, the authorized amount of pig iron would be decreased accordingly. It is considered that there is an ample supply of scrap available for some years to come, if collected and handled effectively.

The committee recommends further that Japan's machine tool production capacity of 20,000 to

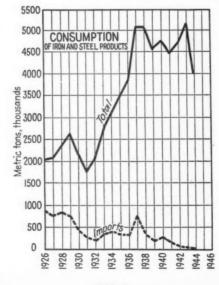


FIG. I

25,000 units per yr should be maintained to meet the essential requirements of her peacetime in-Twenty firms are the principal builders, and their production should be equal to the replacement needs of other than warmaking industries. Estimating that Japan now has about 1,100,-000 machine tools (mostly prewar imports) in operating condition, the report advises the elimination of about 50 pct of these, mostly in industrial plants which were the basic support of Japan's war potential.

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The report stresses that no iron and steel exports should be permitted, except where necessary to prevent serious disruption to the economies of countries previously dependent upon Japan.

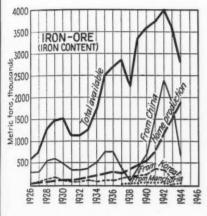
Official Views

The U.S. officials on the spot are reported in London to favor an authorized total output of 1.3 million ingot tons, which was the general level of requirements during the period 1917-25 when about 50 pct was covered by im-Thereafter war preparations stepped up the demand at an increasing rate, as will be seen from fig. 1, while at the same time development of the iron and steel industry had enabled dependence upon imports to be reduced and had established a production basis which, even after war damage, still exceeds the 1917-25 level.

The period 1917-25 also covers an increase in constructional activity following upon the 1923 earthquake, when greater demands were made on steel for constructional purposes. In postwar rebuilding the Japanese will doubtless again take the opportunity of replacing wooden structures with steel framed or reinforced concrete structures, and due allowance has been made for the fact that postwar steel requirements for non-industrial purposes will be greater than in the past.

State and Industry

By external circumstances and by the ambitious temperament of



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FIG. 2

her own people, Japan was obliged to attempt to compress into a few decades economic development which most other industrialized countries had spread over half a century or more. This late and concentrated development has been of advantage to her in some respects, because she has been able to profit by knowledge gained by her rivals in long and often painful processes of trial and error. In other respects it has operated to her disadvantage, because there is certain necessary knowledge which can be acquired only by experience. Nevertheless. Japan's development as a modern industrial state during the past 75 yr has produced startling results, and Dr. R. R. Sayers, director of the U.S. Bureau of Mines, openly states his opinion that if Japan had been able to exploit fully the resources of the overrun countries and to harness the available manpower, she would have been well on the way to world domination.

Industrial development began in the Meiji era, in the latter half of the nineteenth century, when the second impact of Western nations introduced to Japan the products of an industrial civilization centuries in advance of her own. The Meiji Government, rather than leave the nation to struggle along an arduous and expensive way to tardy development, decided to enter the industrial field as instructor. It promoted or took over most of those industries of national importance (munitions, shipbuilding, mining, railways, etc.), and although in course of time some were turned over to private enterprise, the state retained

its powers of guidance and inter-

During the development period, government policy was consistently to aid by subsidies and other means the development of those industries which could contribute to an increase in the country's war potential. The pattern of monopolistic control thus early established was not without effect on the subsequent course of industrialization. The national leaders, already possessed of authoritarian control over every aspect of Japanese life, were confirmed in their attitude towards state operation, and never fully relinquished their powers over those industries which directly contributed to national defense.

By 1930 industrial production in Japan proper had reached a value of 7,114,000 yen (\$3,546,320), but even more significant than the general growth of industry was its changing composition. For from 1930 onwards it was the heavy and war industries which continued to expand rapidly, the predominance of textiles being overshadowed by the gains of heavy industry. From 1932 development of Japanese economy was openly and officially described as "junsenji-keizei" or quasiwartime economy. Crude steel output, which was 2.3 million tons in 1930, rose to 7.2 million tons in 1938. and had reached the rate of 7.8 million tons per annum when Japan declared war on the United States (see fig. 5). This rapid increase was planned, directed and subsidized by the state.

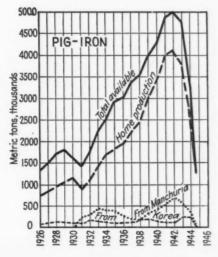
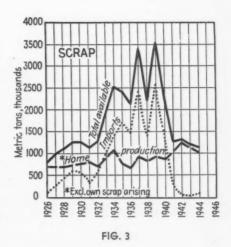


FIG. 4



State-Controlled Plant

Of the 31 steelmaking companies in Japan proper, only five were completely integrated. And of these five, by far the most important was the state-controlled Japan Iron Co. (Nippon Seitetsu), formed in 1934 by merging the six leading producers with the government steelworks at Yawata on Kyushu Island. It was at Yawata that Japan's first modern blast furnace was built in 1901. Today the plant has 12 blast furnaces. including two of 1000 tons, one of 700 tons, and three of 400 tons. During the war the Yawata plant produced more than half Japan's total output of pig iron, and despite air raid damage still retains a capacity of 2,100,000 tons per annum. Its peak ingot output in 1943 was 2,123,000 tons. There are 42 openhearth furnaces, including four of 100 tons and two of 200 tons capacity, and also a 15-ton acid openhearth furnace.

Electric steel capacity was only 26,000 tons in 1936, but additional arc furnaces (ranging from 5 to 15 tons) and an unspecified number of 1-ton induction furnaces had stepped capacity up to 200,000 tons by 1944. Yawata electric steel capacity is still the largest of any Japanese plant, although war damage has reduced it to 164,-

000 tons per annum.

The Yawata plant is completely integrated from coke ovens to rolling mills, and possesses sufficient primary rolling capacity to keep its secondary mills fully occupied. Present capacity, allowing for wat damage, is 630,000 tons bars, 336,-000 tons sections, 250,000 tons sheets and tinplates, 520,000 tons plates, 300,000 tons rails and ac-

TABLE I

JAPAN IRON CO. (Nippon Seitetsu)

Annual Production Capacity (in thousands of metric tons)

	Pig	hron	Crud	e Steel	Rolled P	roducts	Electric Steel	
Plant	1944	War End	1944	War End	1944	War End	1944	War End
Yawata (Kyushu)	2190 1155 602 700	2100 1137 235 700	2492 500 587 600	2343 300 287 600	450	2343 175 (bars only) 450 only)	200	164
Fuji (Honshu)			64	64			24	24
	4647	4172	4243	3594	3583	2868	224	188

cessories, 120,000 tons wire products, and 87,000 tons other unspecified products.

Yawata has its own coal mines about 30 miles away at Futasi, where normal average annual production is over a million tons. Magnetite is available at Kamaishi (Honshu) and bog iron ore at Wanishi (Hokkaida). The six plants comprising the Japan Iron Co. are shown in detail in table I. Mitsubishi, one of Japan's "big four," had a financial interest in the concern.

The remaining principal producers of Japan proper are shown in table II. In addition to these

major plants, there is a large number of small and widely dispersed openhearth and electric furnaces.

Home Islands

Due to the rapid growth of her iron and steel industry, together with the installation of modern facilities and the introduction of modern techniques, Japan entered the war with a fairly well integrated and coordinated iron and steel industry. All evidence indicates that the Japanese possessed both the technical knowledge and the engineering facilities for building all types of equipment

and furnaces used by the iron and steel industry, and also had competent furnace technologists capable of obtaining proper equipment performance.

Although Japanese ability to construct the secondary type of rolling equipment has never been questioned, doubt was expressed before the war concerning their ability to construct the primary type of rolling mill, it being inferred that they were completely dependent on foreign sources for such equipment. However, two companies—the Tokyo Roll Co. and Japanese Shibaura United—are known definitely to have been

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TABLE II

IRON AND STEELMAKING CAPACITIES (Japan Proper)

In thousands of metric tons

	ŀ	HONSHU		H	OKKAID	0		KYUSHU		то	TAL JAP	AN
Product	Main Plants	1944	War End	Main Plants	1944	War End	Main Plants	1944	War End	Main Plants	1944	War
Pig iron Openhearth steel Bessemer	8 26	2954 6240 500	2121 5000 500	1 2	1155 1000	1137 800	2 3	2445 2673	2355 2504	11 31	6554 9913 500	5613 8304 500
Electric	39	2933	2613	2	39	39	2	336	240	?	3308	289
Rolled products	9	5666	5131	1 1	180		3	2721	2591	45	8567	777
Special steels										134	1386	
Forged steel										108	210	
Cast steel										256	340	
erroalloys										80		
Sponge iron			267		9				9			28
Electric pig iron												20
Charcoal pig iron												1

TABLE III

PRINCIPAL IRON AND STEEL PRODUCERS

Capacity in thousands of metric tons

	Pig	Iron	Openhea	rth Steel	Rolled I	Products	Electri	c Steel
Plant	1944	War End	1944	War End	1944	War End	1944	War End
ONSHU ISLAND								
Japan Steel Tube Co.								
Kawasaki	931	576	610	200	940	780	44	43
Bessemer steel			500	500				
(only Bessemer plant in Japan)								
Tsurumi	182	71	380	380	516	346		
Nakayama Steel Tube Co.								
Osaka	365	365	229	229	280	280		
Funamachi							7	7
Amagasaki Iron Co.		1						
Amagasaki	128	128	382	382	384	384	15	15
Kotobuki Juko	120		002	-				
Kyoto	30	30	30	30 .			14	8
Azuma Seiko	00	00	30	00 *			-	
Azuma			122	122	108	108		
Daido Seiko			122		100	1		
Osaka			80	80				
Hoshimzaki		****					140	98
Tsukiji	* * * *		****				39	27
Atsuta			****	****			20	18
Kawasaki Juko			****	****				1
Kobe			526	526	447	447		
Kobe Seikosho		****	320	320	441	441		
Kobe			434	213	340	340	66	69
Mitsubishi Seiko		****	434	213	340	340	. 00	00
			44	41			26	26
Tokyo			41	144				
Nichia Seiko		****	144	144		****		
Osaka Seiko			105	100			7	6
Nishijima			135	135	****	****	,	0
Sumitomo Kingoko			100	100			25	20
Amagasaki			180	135		****	113	113
Osaka			128	128		****	19	16
Wakayama			220	220		****	19	1 10
Yamato Seiko			400	- 00				
Osaka			167	60				
KYUSHU ISLAND								1
Kokura Steel Co.				404	047	049		
Kokura	255	255	161	161	217	217	****	
Mitsubishi Seiko					44			
Nagasaki		****	20	****	44			
HOKKAIDO ISLAND								1
Nippon Seiko					10	10		
Muroran			500	500	12	12		1400
Japan Iron Co	4467	4172	4243	3594	3353	2868	224	188
			-			2025	200	644
	6358	5597	9232	7780	6671	5872	759	644

producers of primary rolling mills. Japan's foreign purchases of primary rolling mills appear to have been made to take advantage of lower cost and to promote more rapid expansion of their industry, rather than due to their actual inability to build. In fact, their main interest after 1940 seemed to be to obtain foreign mill designs for construction in Japan.

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Although the distribution of the various types of rolling facilities might indicate a relatively balanced position of the Japanese industry as a whole for war production (see tables II and III), never-

theless with one or two notable exceptions relatively few of the individual plants are found to be completely integrated, with the result that considerable interplant shipments of material took place within the industry generally.

Approxi-

TABLE IV

HOME ISLANDS: RAW MATERIAL POSITION, 1937
(In thousands of metric tons)

Production	Imports	Total	Main Sources of Imports
296 (a) 704 (b)	2554 1131 2420	2850 1131 3324	Malaya, China, Korea. India, Russia, Manchuria. U.S.A.
1000	6105	7703	
	296 (a) 704 (b)	(a) 1131 704 (b) 2420	296 2554 2850 (a) 1131 1131 704 (b) 2420 3324

 (a) Only imports of pig iron are shown, since the metal raw material for the home production is shown as iron ore.
 (b) Excludes own scrap arising. mately 61 pct of the ironmaking, 82 pct of the steelmaking, and 92 pct of the rolling facilities of the former Japanese Empire are located in Japan proper, where a significant concentration of Japanese capacity exists in relatively few areas and plants. Four districts together contributed roughly 95 pct of the ironmaking, 95 pct of the openhearth steelmaking, and 74 pct of the rolling capacity of Japan proper (see map). The combined facilities of only four plants represent about 74 pct of the iron, 37 pct of the steel, and 44 pct of the finished steel capacity.

Steelmaking Processes

Basic openhearth constitutes by far the most important steelmaking process, only one plant at Kawasaki (Nippon Kokan) producing bessemer steel. Production there was 333,000 tons in 1941, 352,000 tons in 1942, and 193,000 tons in 1943. Capacity of this plant remains unchanged at 500,000 tons per annum.

The contribution of electric furnaces to the total capacity is very significant, being found in Japan in greater proportion than in any other industralized country. Whereas in Japan, electric steel capacity represents about 33 pct of the total steel capacity, in the U. K. and the U. S. it is

only about 5 pct. The cheapness and abundance of hydro-electric power favored the rapid increase in production from 242,649 tons in 1935 to 2,778,995 tons in 1944, and the furnaces were primarily constructed to use domestic ore.

Harbin JAPAN KOREA & MANCHURIA COAL, IRON & STEEL Hsinking Mukden Fushun Pensihu Miyanahara S E A Japan Iron Co. Kokura Steel Co. Mitsubishi Seiko Pig 2.4 Steel 2.5 Japan Iran Co. Nakayuma Steel Tube Kobe Sei ko A magasaki Iran Co^o. Sumitomo King Kotobuki Juko Dardo Seiko (Pig 1:2 Steel Sumitomo Kingoko Yamato Seiko (Pig 1·2 Steel 3·3) Scale of Miles

The total production of alloy steel averaged 16,000 tons per annum from 1926-29, and rose to 18,000 tons in 1930, 69,000 tons in 1935, 262,000 tons in 1940, and 938,000 tons in 1944. Several years' stocks are still on hand.

It may be assumed that the great expansion of electric furnace production was primarily for war purposes. Future requirements will be therefore of a minor nature, and retention of any part of the widely dispersed electric fur-

nace:

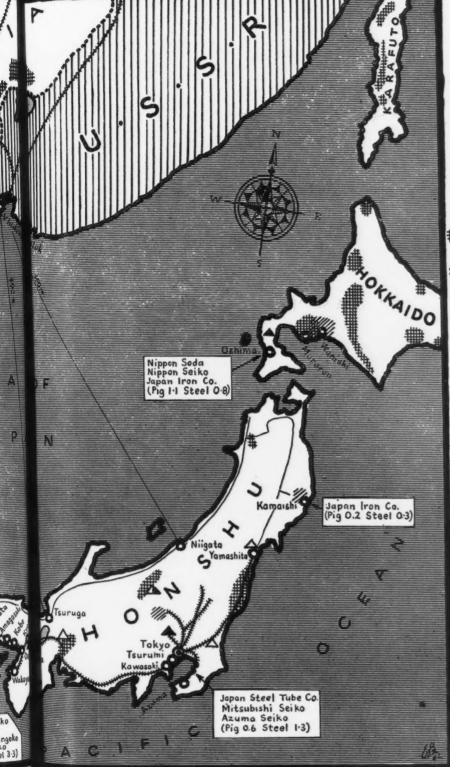
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PIG-IRON O-H STEEL

(Capacities of the principal districts as at war-end in millions of metric tons)

RAIL LINES

(in Japan, only double-track lines are shown thus)

SINGLE-TRACK LINES (Japan only) or approximately 8 pct of the total ironmaking facilities on the home islands. Of this capacity, 285,000 tons are for sponge iron manufacture, which is especially attractive to the Japanese because of the availability of materials suitable for this process.

Since 1935, concentrated research has been carried out in the development of this process, and large government subsidies have fostered production both at home and in Korea and Manchuria. with a view to the use of this material either as a substitute for scrap in the openhearth and electric furnaces, or without scrap for steelmaking direct.

A governmentsubsidized plant at Toyama, Honshu Island, appropriately styled the Patriotic Sand-Iron Co. (Hokoku Satetsu Seiren), has been making sponge iron from sand by the electric furnace method since 1935, and has a capacity of 8000 tons per annum. The Nippon Satetsu Kogyo concern, Honshu Island, is another iron - from - sand pioneer since 1934. Its specialty is ferrovanadium and vanadium steels, the iron oxides in

the sand being reduced in rotary kilns, and the resulting sponge iron melted in electric furnaces to facilitate removal of titanium, etc. Capacity at the Takasago plant is 12,000 tons per annum, and at Hachinoe 36,000

nace and special steel plants would constitute a potential military resource. A recommendation has been made for the elimination of all special steel production, and for stocks of special steel not suitable for peacetime requirements

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to be made available for reparations. All future requirements of such material should be imported.

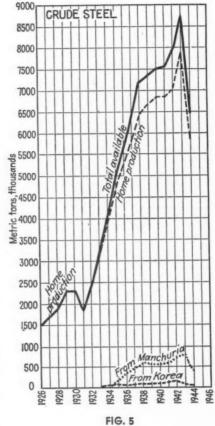
Sponge Iron: In Japan proper ironmaking equipment other than blast furnaces accounts for about 515,000 tons of effective capacity,

tons per annum. Taika Kogyo of Kisagata has capacity for the production of 20,000 tons per annum of sponge iron from limonite. Toa Jukogyo of Yahita (Kyushu) has facilities for making 7000 tons per annum of sponge iron from mill-scale

Three Krupp-Renn rotary kilns were in use from 1940 onwards at the Ominato plant (Honshu Island) of the Japan Special Steel Tube Co. (Nippon Tokoshu Kokan). These were claimed to eliminate the lining difficulties experienced with the three Bassett type kilns of 150 ton daily capacity The iron which they replaced. sand was first treated in magnetic separators to concentrate the ironbearing material, which was then passed through the rotary kilns. Production was hampered by lack of adequate equipment for separating the iron from the slag, and in 1941 plans were drawn up to install additional separating equipment. The theoretical sponge iron capacity of the Ominato plant would be in the region of 100,000 tons per annum.

Korea and Manchuria have sponge iron making facilities on a much larger scale than in the home islands. Showa Seikosho, the semi-governmental steel plant in Manchuria, planned to produce in their Krupp-Renn plant about 240,000 tons per annum from low grade local ores by the end of 1942. There were two Krupp-Renn units in operation, each with two kilns, and a third unit was under construction, but probably never came into production. The government plant at Seishin, Korea (Japan Iron Co.), has four Krupp-Renn kilns with a capacity of 180,-000 tons per annum.

Further investigation may reveal that the development of this process may be of greater importance to the Japanese economy than has been previously realized.



Pig Iron and Scrap: To ascertain the relationship between Japan's pig iron and steelmaking facilities, it is necessary to consider the use of scrap in her steel plants and foundries. Prior to the Pacific war the industry used in general more than 50 pct scrap in its openhearth furnaces, requirements being covered by heavy imports from the U.S. and other countries. The vulnerability of scrap supplies was fully realized by the Japanese Government, who as early as 1937-38 took vigorous measures to force the industry to alter its practice and increase the proportions of pig to scrap in the furnace charge. It was at that time that the decision was taken to step up the production of pig

iron and sponge iron in Manchuria and

Korea.

The goal was a ratio of 70 pct pig to 30 pct scrap in the furnace charge, which would make the industry practically independent of

outside sources for scrap. This was the basic idea behind the large and steady increase of pig iron producing facilities (see fig. 4). But although table III indicates that as far as installed capacity is concerned the Japanese achieved their goal, and for all practical purposes pig iron capacity could be considered in balance with steelmaking facilities, in actual practice, however, the proportion of pig used was probably less than the established goal, as some of the technical difficulties arising from the adoption of such a high ratio of pig to scrap were not finally overcome. The probable openhearth mixture ratio was 65 pct pig to 35 pct scrap.

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Castings and Forgings: Apart from production in the larger iron and steelmaking plants, numerous small and scattered plants made castings and forgings from purchased raw material. Total iron casting capacity would be about 2,500,000 tons per annum as poured, or 2,000,000 tons per annum of rough iron castings. Steel casting capacity would be about 450,000 tons per annum as poured, or about 340,000 tons per annum of finished rough steel castings.

Production of forged products in 1935-36 amounted to about 1.4 pct of steel ingot production. The proportion of heavy forgings direct from the ingot, and smaller ones of the hammered type from rolled steel, would be about 25 pct and 75 pct respectively.

Raw Material Supplies

Japan's rapid rise to sixth place as a steel producer by 1936 was in no way due to any natural advantages such as the possession of home raw material resources. She is much poorer as an industrial base than Germany, having nothing comparable with the Ruhr and Silesian coalfields. Her iron ore is low grade and the deposits (totaling less than the U.S. A.'s annual production) are inconveniently located in the difficult mountainous districts. Her limited reserves of coal are unsuited to coking, and the mines have a one-sided location in the eastern and western parts of the country. Her railways are narrow gage, mostly single track, and unsuited to fast and heavy freight traffic. Canals are non-existent, and road transport is limited to the areas immediately

	TAB	LE V	
SHOWA			(Manchuria)
	Wartime	Capacity	1

Products	Thousands of Metric Tons	Products	Thousands of Metric Tons
Pig Iron	2400	Billets, sheet bars	500
Sponge iron	150	Rails & structural steel	200
Openhearth steel	1575	Bars	105
Electric steel	. 5	Wire rod	50
Blooms		Black sheets	105 50 50

around the towns and cities. The interior roads are unsuitable for heavy transport, and to the Westerner, the lack of truck transport is striking. Coastal shipping plays the most important part in the movement of goods in normal times.

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Before the war 80 pct of the raw materials for steelmaking in the home islands were imported. Table IV summarizes the position in 1987. In addition a considerable part of Japan's requirements of coking coal had to be imported, chiefly from China.

During the war the loss of outside supplies, notably American scrap, Malayan ore (due to shipping difficulties) and Indian pig iron, was compensated by the development of pig iron production based chiefly on increased import of ore from China.

The Inner Zone

The three countries of the socalled "Inner Zone"—Manchuria, Korea and Occupied China—accounted for over 40 pct of the total pig iron capacity of the Japanese Empire, and 20 pct of the ingot capacity, 10 pct of the rolling mill facilities, and 50 pct of the coking plant. The opening up of the Manchurian and Chinese orefields replaced supplies of Phil-

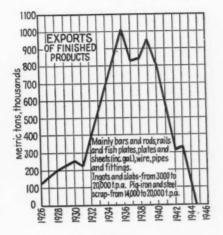


FIG. 6

ippine and Malayan ores, and the extension of the ore beneficiation process made possible the utilization of the lean but plentiful cres of northeast Korea. Stockpiles of tungsten and nickel replaced Burmese imports, and as a last resort, the "Inner Zone" was prepared as a dispersal point for Japanese industry.

Manchuria

However baneful and dangerous the political effects of Japanese penetration may have been, it certainly stimulated the economic development of Manchuria to an extraordinary degree. Priority over all other occupied territories was given to Manchuria, and the Japanese poured capital and machinery into the country, partly to realize economic profit on their huge investment in military expenditure, and partly to overcome the shortcomings of the home islands in raw materials for the basic industries in preparation for the war to come. Japanese investments in Manchuria totaled more than 3500 million yen (\$800 million) at the end of 1938.

The framework on which this development proceeded was the railway system (see map), and the story of the opening up of the Manchurian steppe is not unlike that of the Canadian prairie, with which it is physically comparable. The railway companies themselves engaged in productive enterprises such as mining and steelmaking. The South Manchurian Railroad Co. opened up and operated the Fushun mines east of Mukden, where reserves of coal are estimated at 1000 million tons. Total reserves in Manchuria are estimated at some 20,000 million tons, about 11,000 million being in the north and 9000 million in the south; only a small part, however, consists of coking coal. The best grade comes from Mishan in the east (Tungan Province) and from the Hokang field in the north (Sinkiang Province). The vital role played by Manchuria in Ja-

TABLE VI PRINCIPAL IRON AND STEELMAKING PLANTS OF MANCHURIA

Capacity up to war end
(In thousands of metric tons)

		. In	ron	Ste		
Firm	Town	Pig	Sponge	Openhearth	Electric	Finished Products
howa Seikosho	Anshan	2400	150	1575	5	435
nsnan Kozai	Anshan	****				60
lanshu Roll	Anshan	* * * *			8	50
lanshu Sumitomo	Anshan	* * * *				50
onkeiko Batetsu	Mukden	183		51		****
Ulikelko Bateteli	Myanohara	475	20		-	****
Jun Seitetsuio	Fushin		38		34	****
alishu Kosho	Mukdon				4	
ansnu imono	Mukdon				4	
ansnu imono	Vamata (Mukdan)				8	
Mengu Kaihaten	Erh-tao-chiang	132	30		95	
alka Denki Yahin	Kanseishi				30	20
		3190	238	1626	195	615.

pan's war preparation is shown by the stepping up of coal production from 9.07 million tons in 1933 to 14.42 million in 1937.

Iron Ore Reserves total some 4500 million tons, over half lying in the district to the south and southeast of Mukden. Other ore fields are found in the Tichling-Kaiyuan and Tungpientao districts. Only about 134 million tons have an Fe content of 50 pct and over, the bulk being just over 30 pct Fe. Output was stepped up from 0.98 million tons in 1932 to 1.9 million in 1936, and the ultimate goal was to be 12 million tons.

Ore export to Japan was small (see fig. 2), the greater part of the output being consumed in the blast furnaces of Manchuria and shipped in the form of pig iron or crude steel.

Iron and Steel Exports to Japan reached a peak of 700,000 tons pig iron in 1942, and 800,000 tons crude steel in 1943 (see fig. 5). The principal producer is the Showa Steel Works (Showa Seikosho) at Anshan.

The original Anshan works were established by the South Manchurian Ry., being reincorporated later as an independent concern, and finally made into a semigovernmental organization in 1939.

The Showa plant developed its own magnetic roasting and sintering process for the utilization of local Taikosan lean ores (Kynchorei and Tungpientao ores going direct into the blast furnace). Although beneficiation rendered these low grade ores usable, it caused certain chemical changes in the concentrates which hindered reduction in the blast furnace. About 20 pct of the crushed ore was too fine for the roasting furnaces, and was diverted to a supplemental Krupp-Renn plant (see under Sponge Iron). The resulting "luppe" was said to be in great demand for use in electric furnaces in Japan, and the Sanyo Steel Co. (Hyogo-ken) purchased part of the output to make bearing steel.

Because of the nature of the iron and other materials available at Showa, a process differing from the usual openhearth practice was adopted for steelmaking. This included an intermediate refining stage in active mixers prior to final refining in tilting openhearth furnaces. These active mixers were utilized to reduce somewhat the relatively high impurities such as silicon in the molten pig iron, and to provide a more uniform charge for the openhearth furnaces. The mixers and openhearths were arranged in a straight line to provide for the continuous flow of hot metal through the plant. Another reason for the adoption of this process was to utilize a high ratio of hot metal to scrap (80 to 20 pct), thereby consuming a large proportion of Showa's own pig production and becoming self-sufficient in scrap. "Luppe" from their Krupp-Renn kilns was also employed. Table V shows the approximate capacity of the Showa plant in 1944. Since that date a certain amount of dismantling has occurred, and no information is yet available as to the present position.

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Korea

Both coking and bituminous coal is lacking in Korea, heavy imports of the former being made from Manchuria and a limited amount of the latter from Japan proper. The 1944 total output was 7,618,866 tons, of which 62.7 pct was anthracite and 37.3 pct lignite.

Ore production in 1944 totaled 3,331,834 tons, the greater part being produced in the north. High grade ore (50-60 pct Fe) is mined on the west coast, output being about sufficient to keep the blast furnaces at Kenjiho working to capacity. Enormous deposits of low grade magnetite ore (33 pct Fe) lie in the Northeast, where the Mitsubishi Mining Co.'s plants process it into concentrates of 65 pct Fe before shipment to Japan or smelting in the Seishin blast furnaces.

In addition to the Seishin plant mentioned previously, there were three other concerns in Korea making sponge iron. Nippon Koshuha at Joshin produced special

TABLE VII

PRINCIPAL IRON AND STEELMAKING PLANTS OF KOREA

Capacity up to war end
(In thousands of metric tons)

		Ir	ron	Ste		
Firm	Town	Pig	Sponge	Openhearth	Electric	Finished Products
Nippon Seitetsu		438		240		180
Nippon Seitetsu	Seishin *	365	180	245		
Nippon Koshuha	Joshin *		58		50	37
Nippon Koshuha	Fuhei				7	
Chosen Kikai	Jinsen		1	17		
Chosen Riken	Jinsen		55		50	
Chosen Chisso Hiryo	Konan *		23		21	
Chosen Daido Denki	Heijo *				21	
Chosen Denki Kohyo	Fusan				7	
Chosen Jukogyo	Fuean		* * * * *		7	
Onobbii Sakogjo	Fusan	****			,	
	1	803	316	502	163	217

^{*} Russian occupied zone.

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may also be applied to the direct recovery of tungsten, molybdenum, and chrome. The iron produced is a form of sponge iron, and is converted into steel in the company's electric furnaces. This firm's special steel is reported as being used for aircraft, armor plate, automobiles, magnetic steel and high speed tools. The process employed is stated to make the plant self-sufficient in iron. The firm's original plant where the high frequency ironmaking process was perfected is at Kita-Shinagawa, Honshu Island. Chosen Riken at Jinsen developed their own "Riken" process of sponge iron manufacture in rotary kilns, but operations were considered to be unprofitable and the plant was reported sold to the Kanemi interests in 1943. Chosen Chisso

steels by the "Kikuchi" high fre-

quency smelting method. It is

claimed that the process produces

99 pct iron direct from lean ores

and iron bearing sand, and that it

Occupied China

phuric acid plant.

Part of the considerable coal reserves consists of good coking coal which was exported to Korea,

Hiryo Konan used the Bassett ro-

tary kiln process, the raw material

being pyrites cinder obtained from

pyrites proce-sed by the firm's sul-

Manchuria (the Showa plant took one million tons a year) and Japan proper. Her iron ore reserves are much more extensive than those of Japan, and of considerably higher Fe content than those of Manchuria. She also produces half the world's output of tungsten and 6 pct of the world's tin, and there is also some manganese. Pig iron capacity is mainly in the north.

As the war progressed, the Japanese decided to abandon active exploitation in Central China and concentrate all their activities in the north. Thus ore mining ceased and iron and steelworks equipment was in process of transfer northwards. Considerable expansion of ore mining and pig iron production was planned as well as the construction of a new steelworks, to lessen the burden of transport facilities to Japan. But when the need was greatest the shipping and transport bottleneck caused a drop in the tonnages reaching Japan.

War End

At the time of Japan's capitulation her overall economic position showed such a remarkable deterioration that it was apparent she would be unable to continue the struggle for long. Thus while the advent of the atom bomb might have determined the actual date of the surrender, Japan's economic life was already in such an advanced state of chaos that the end under any circumstances could not have been long delayed.

Although the most important single factor which crippled Japan's war production was undoubtedly aerial bombardment, it was found that, as in the case of Germany, the bombing of heavy industry had only relatively slow repercussions on the Japanese war machine. The tightly drawn naval blockade of the home islands was the most important factor in the steep drop in steel output between 1942-44. As imports dropped efforts were made to increase home output of sponge iron in the Krupp-Renn and Bassett kilns, and the direct process of steelmaking from sandy magnetite material in the electric furnace. But the available equipment was insufficient. The shortage of alloying elements even caused attempts to be made to use plain carbon steel for aircraft engine parts such as crankshafts, propeller shafts, connecting rods and crankcases.

Actual destruction of steel producing capacity by bombing of the major areas of the home islands was relatively slight. Of the openhearth capacity of 9.4 million tons, 7.7 million remain intact, and 6.9 million tons of the former 7.9 mil-

TABLE VIII

PRINCIPAL PRODUCERS OF NORTH CHINA

Capacity up to war end
(In thousands of metric tons)

			Ir	on	St		
Province	Firm	Town	Pig	Sponge	Open- hearth	Electric	Finished Products
lupeh	Han-Yeh-Ping Iron & Coal Co	Tayeh	329				****
lopeh	North China Manufacturing Co (Kita Shina Seitetsu)	Shi-Chiang-Shan	164				
lopeh	North China Manufacturing Co (Kita Shina Seitetsu)	Tangshan	73				
Chahar	North China Manufacturing Co (Kita Shina Seitetsu)	Hsuan-Hua	146				****
hahar	Hsinmeng Iron Works	Hsuan-Hua	37				****
nhui	Maanshan Iron Works	Maanshan	73	****	1444	****	45
hansi	Shansi Sanyo K. K	T'ai-yuan Tang-ch'uan	58 18	10	117		45
nansi	Shansi Sanyo K. K	T'ai-yuan			* * * *	6 2	
Shantung	Tsingtao Iron Co	Tsingtao	113		****	****	
			1011	10	117	8	45

TABLE IX

Production and Imports 1930-1945
(in 000 metric tons)

			IF	RON-ORE (Iron Content)					SCRAP			
				lmp	orts				-				
Year	Home Production	Korea	Manchuria	China	Philippines	Malay	Others	Total Available	Home Products	Imports	Total Available	Home Production	Korea
1930										489		1,162	
1931										296		917	95
1932	115									559		1,102	206
1933	160									1,013		1,437	160
1934	215									1,413		1,728	164
1935	260	121		757		929	381	2,448		1,692		1,865	131
1936	309	121		751		1,066	466	2,713	648	1,497	2,145	1,972	123
1937	298	151	1	358		1,029	1,015	2,850	904	2,420	3,324	2,252	135
1938	364	184	2	88		1,008	624	2,270	815	1,358	2,173	2,467	215
1939	447	200	7	411		1,220	1,090	3,375	919	2,555	3,474	3,068	221
1940	557	220	28	705		1,286	813	3,609	869	1,391	2,260	3,417	164
1941	745	380	31	1,529		752	323	3,760	1,021	234	1,255	4,088	138
1942	1,179	339	37	2,424	17	57	37	4,090	1,250	39	1,289	4,119	133
1943		120		1,920	76	27	4	3,606	1,134	25	1,159	3,804	269
1944	1,911	329	5	595	14			2,854	1,012	74	1,086	2,564	245

lion tons rolling capacity are still in working order.

Present Position

Now it is Japan's turn to be assessed for reparations. The Japanese, unlike the Germans who in the occupied countries attempted but little in the way of actual industrial development and construction, found in under industrialized East Asia a vast field for intensive development of transport and industry. And all these external assets should now become available for reparations account. Claims have been submitted on behalf of certain British Dominions and Colonies and also by China, who expected large quantities of capital equipment to be left available in Manchuria. Unfortunately for China the Soviet forces in Manchuria on their withdrawal removed a certain amount of key plant and machinery. This leaves Japan as the main source of capital equipment for reparations, much of which, in view of American determination to cut down Japanese heavy industry to the absolute minimum, is likely to be iron and steelmaking and finishing machinery. The Chinese urgently need all they can obtain, together with much construction material both for reconstruction and for their belated industrialization plans which the recent years of warfare delayed still further.

Further Outlook

The growing industrialization and the attendant development of communications and transport facilities should result in an expanding market for capital goods in the Far East generally. China's plans alone call for the construction of 40,000 miles of railroad. together with a comprehensive system of highways, inland waterways and internal airlines. Mining equipment is badly needed to restore the tin mines of Malaya and the Dutch Indies. Although the Potsdam agreement looks to "eventual Japanese participation in world trade relations," Japan is unlikely to resume iron and steel exports for some time, leaving the enormous potential market in the Far East open to other steel exporting countries.

Her present overall crude steel production of around 40,000 tons monthly is reported to be far short of current domestic needs, coal shortage being the limiting factor. Electric furnaces are responsible for a large proportion of present

output, but expansion here is handicapped by the limited supply of graphite electrodes. Looking to the future, it would be unwise to count upon an extensive degree of "pastoralization" being applied in practice to Japan by the Americans. Before the war it was generally agreed that Japan was suffering from agricultural overpopulation, her inhabitants per square mile of arable land being 2774, as compared with 2170 in 1709 in United Kingdom, Belgium, and 806 in Germany. Only 20 pct of the labor force was engaged in industry in 1937 (40 pct in the United Kingdom), and 45 pct in agriculture (7 pct in the United Kingdom). The prewar population of 70,000,000 was rising at the rate of 1,000,000 per annum, which meant an addition to the working population (men and women between 15 and 60) of about 500,000 a year, and it was generally agreed that the only peaceful solution of the population problem lay in the further industrialization of Japan proper.

The problem takes on an added significance with the end of the Japanese Empire. The limitation of heavy industry will lead to a greater reliance on the lighter industries, particularly consumer goods industries. And with a well

Imports

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TABLE IX-Continued

JAPAN

Production and Imports 1930-1945 (in 000 metric tons)

PIG-IRON				C	RUDE STE	EL				COAL		
Imports			Home I	slands	lmp	oorts						
Manchuria	Others	Total Available	Production	Of which Electric	Korea	Manchuria	Total Available	Rolled Products (Japan proper)	Home Production	Imports	Total Available	Year
												193
242	158	1,412	1,883				1,883					193
322	122	1,752	2,398				2,398					193
455	186	2,238	3,198		5		3,203					193
409	205	2,508	3,844		60		3,904			*******		193
383	579	2,958	4,704	242	97	137	4,938	3,737,067	37,762	5,381	43,143	193
271	701	3,067	5,223	317	87	344	5,654	4,248,253	41,803	6,282	48,085	193
213	793	3,383	5,801	435	103	451	6,355	8,673,605	45,258	6,178	51,436	193
210	647	3,539	6,472	758	106	622	7,200	4,870,507	48,684	6,829	55,513	193
352	352	3,995	6,696	889	112	562	7,370	4,609,536	52,409	8,285	60,694	193
431	259	4,271	6,856	1,084	109	554	7,519	4,522,301	57,309	10,123	67,432	194
553	93	4,872	6,844	1,221	157	573	7,574	4,183,948	55,602	9,807	65,409	194
715	30	4,997	7,044	1,420	179	724	7,947	5,089,822	54,179	8,884	63,063	194
544	183	4,800	7,833	2,228	108	837	8,778	6,089,832	55,539	6,117	61,658	194
306	112	3,227	5,849	2,779	93	437	6,379	2,607,828	49,335	3,324	52,659	194

disciplined hardworking people, with wages at about one fourth of those prevailing in Britain, and a much lower standard of living, competition even during the occupation in those very products in which competition was so keen before the war, is likely to be more

Additional Materials Allocated by CPA To Aid Housing Program

Washington

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• • Through amendment of chedule A, PR 33, effective Oct. 7, dditional building materials inluding specific hardware, plumbng, heating and roofing items, lave been added to the list of ma-erials which CPA may allocate for the housing program.

In general, these priorities will onsist of HH and HHH ratings. erms and conditions of assignent as well as requirements for se are those already imposed uner PR 5 and PR 33 and other egulations of the CPA and NHA.

Materials covered by the latest evision of the schedule include the ollowing residential type items:

Wire and cut nails, 2d to 20d (except to 10d cement and bright box), nails d brads smaller than 2d but suitable roofing, siding, lath or millwork.

Builders hardware; butts, hinges, hasps; or locks, lock trim; sash screen and elf hardware; night latches, dead

locks; spring hinges and sash balances and pulleys.

Bathtubs; low pressure boilers; fittings and trim for sinks, bathtubs, lavatories and water closets, including brass tubular

Warm air furnaces, forced or gravity, of 110,000 or less Btu per hr for gas-fired, 100,000 Btu or less for oil-fired, and grate not larger than 2.64 sq ft for coal-fired; furnace pipes, fittings and duct

Kitchen sinks, combinations, and ires; lavatories; and range boiler

tures; lavatories; and range boilers.

Oil burners, convector and cast fron radiation, stoves and ranges, and stokers.

Cast fron soil pipe and fittings; steel and wrought fron pipe, black and galvanized, % to 4 in. standard wt; and pipe fittings of gray cast recessed drainage of 2 in. and under, gray cast steam fittings of 3 in. and under (125 swp), and malleable fittings including unions of 2 in. and under (150 swp).

Septic tanks; oil and water storage tanks of 500 gal or less capacity; and water heaters.

Fittings for copper tubing.

Fittings for copper tubing.

Copper tubing, types K, L, and M, sizes % to 3 in. and fittings; water closets and combinations.

Prefabricated houses, sections and panels, as defined under Direction 3 to PR 33.

Doors and frames, hollow metal and kalamein; fabricated reinforcing rod and mesh, steel joists, steel and aluminum structural shapes when cut to length or fabricated; and metal window sash and frames.

Metal cabinets, insect screen cloth, caulking lead, metal weatherstripping, and woven or welded stucco mesh.

Copper sheet and flat galvanized steel sheet, 26 gage or lighter, under specific conditions.

severe than previously.

Refuses Steel Priority For a Single Industry

Washington

• • • CPA Administrator John D. Small has announced that he will not give priority or other special help to an individual industry for getting additional steel. In turning down such a recommendation by the electric range industry advisory committee, he said:

"Extra steel for one industry can only come from taking it away from another that needs it just as badly."

While there was little chance to get more steel this year, he said, there is evidence that although steel mills are now running at near capacity, production will have increased by perhaps 2 million tons by the Fall of 1947.

There are also indications, he pointed out, that some industries may soon be requiring less steel as the demands for their products are satisfied and inventories fill up, leaving more steel available for industries with heavy back-

Industrial Briefs ...

- \$12,000,000 MERGER—British Hercules Cycle & Motor Co. Ltd., is to be merged with the cycle interests of Tube Investments, Ltd., the \$72,000,000 combine. The sum involved in the deal is believed to be about \$12,000,000.
- NEW POLYSTYRENE PLANT-Monsanto (Canada) Ltd., subsidiary of Monsanto Chemical Co., St. Louis, has begun production of polystyrene in a new plant whose output will exceed Canada's prewar requirements. It is the first polystyrene plant in the British Empire. With 50 pet capacity now in production, the new unit is expected to attain full production shortly after Nov. 1. About 95 pct of the equipment in the new plant is of Canadian origin and the base material, styrene monomer, is being purchased from the Polymer Corp., a company owned by the Canadian government. The Monsanto Chemical Co.'s company-wide polystyrene expansion program contemplates a total production rate of more than 80 million lb a year early
- Acquires Buildings Pennsylvania Transformer Co. purchased two buildings that were formerly part of the aluminum forging plant operated by Aluminum Co. of America at Canonsburg, Pa. The new owners will move the firm's manufacturing operations to the new plant, according to Samuel Horelick, president.
- PLANT MOVES—Paper, Calmenson & Co., St. Paul, Minn., has moved its plant and office to County Road B and Walnut St.
- Now Owns Plant The Chain Belt Co., Milwaukee, has acquired title to the Ordnance Plant which it operated for the government to make anti-air-craft guns and howitzers during the war. The property covers 18 acres with 314,000 sq ft of manufacturing space. It was purchased at a reported price of \$1,422,000.

- New Hartford Firm The Jor-Mak Mfg. Co. has begun operations in one of the former Kissel motor plants at Hartford, Wis., to manufacture metal cabinets and control boxes. A. J. Jordan, Hartford, is president and John Kofel, superintendent. Both were connected with Maysteel Products, Mayville, Wis.
- SCHAUER INCORPORATED—Schauer Machine, which has two plants in Cincinnati, has been incorporated at 3000 shares, no par stock, representing \$300,000, according to announcement by Fred Weiland, attorney and secretary of the company. Speed lathes, grinding tools, battery chargers and other electrical items are manufactured by Schauer Machine.
- PIPING CONTRACT—In an expansion of its power plant facilities, the city of Los Angeles has awarded the power piping division of Blaw-Knox Co. a piping contract of approximately \$400,000. This will cover the supply and installation of all piping, including high pressure alloy steel piping, to be used in a new steam turbine electrical power unit.
- INDUCTION FURNACES—Installation has recently been completed of new high frequency steel melting furnaces in the alloy steel foundry of the Michiana Products Corp., Michigan City, Ind.
- MERGER AUTHORIZED—Stockholders of Cleveland Automatic Machine Co. have authorized a merger of LeBlond Engineering Co., Cincinnati, into Cleveland Automatic Machine Co. The business of both companies will be continued under Cleveland Automatic Machine Co. name, with the Cincinnati*plant operating as a separate division, according to Harold R. LeBlond, president.

Mystic Furnace Denies New-Management Rumor

Boston

• • • The statement by a national politician that the Mystic Iron Works is to be leased and operated by a group of New England industrialists is without foundation, according to Mystic management.

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Plans for the furnace to resume furnishing foundries in that area with sorely needed pig iron have been under negotiation for a couple of months or longer. The government has agreed to grant a subsidy of \$12 a ton, and the furnace to resume operations Nov. 15, if possible.

The question of raw materials, however, has been a stumbling block in all negotiations. Mystic has approximately 40,000 tons of ore on hand, sufficient for 3 months' normal operation, and at the utmost 4 months. More than 40,000 tons of ore are needed to relieve a serious foundry situation. To date no arrangements have been completed for additional domestic ore tonnages and conditions are not right for importations.

Furnace coke could be furnished by the New England Coal & Coke Co. but the government at first insisted on Mystic obtaining fuel supplies elsewhere. This being impossible, the government has modified its stand in this matter. The government's initial objection was based on fears of a pinch in household fuel supplies this winter.

Those outside interests normally furnishing pig iron are losing money on every ton shipped into New England because of freight rates. Thus with such supplies cut to a minimum and with no likelihood of obtaining Mystic iron for a month or longer foundries are gradually suspending operations, a score or so of them having done so within a comparatively short time.

Reduces UNRRA Tractors

Washington

• • Reduction from 14,500 to 7935 in the number of wheel type and track laying tractors going from the United States to UNRRA countries has been announced by CPA.

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- • Fabricated steel awards this week included the following:
- 2200 Tons, Muskegan, Mich., power plant for Consumers Power Co. to American Bridge Co., Pittsburgh.
- 1500 Tons, Kingham, Ariz., trestle for Davis Dam, U. S. Bureau of Reclamation, to Consolidated Steel Corp., Los Angeles.
- Consolidated Steel Corp., Los Angeles.

 1200 Tons, Odair, Wash., trash racks, Grand
 Coulee Dam, U. S. Bureau of Reclamation, Specification 1291 to Southwestern
 Welding & Mfg. Co., Alhambra, Calif.

 400 Tons, Central Californa, coffer dam for
 Shasta, U. S. Bureau of Reclamation, to
 Consolidated Steel Corp., Los Angeles.
- 250 Tons, Cambridge, Mass., warehouse for Stahleker Steel Co. to American Bridge Co., Pittsburgh.
- 200 Tons, Boston, lintels. Hancock Village housing project to unnamed fabricator.
- 170 Tons, Chicago, Warehouse, White Cap Corp. to J. T. Ryerson & Son, Chicago.
- • Fabricated steel inquiries this week included the following:
- 2000 Tons, Milwaukee, stock house for Blatz Brewing Co., Milwaukee. 1200 Tons, Beloit, Wis., building for Fairbanks, Morse & Co., Chicago.

- 350 Tons, Skokie, Ill., factory building for James P. Natsh Corp.
 350 Tons, Russell, Ky., Chesapeake & Ohie R. R. extension to shop buildings, bids in.
 340 Tons, Tamaqua, Pa., Lehigh Navigation & Coal Co., building, bids in.
- 300 Tons, San Francisco, E. I. du Pont de Nemours & Co., manufacturing building, Oct. 18.
- 295 Tons, Laredo, Tex., theater for Warner Bros.
- 25d Tons, Rahway, N. J., Merck Chemical Co., buldings, bids due, Oct. 18.
- 218 Tons, Green River, Col., continuous beam bridge.
- • Reinforcing bar inquiries this week included the following:
- 750 Tons, Chicago, southwest intercepting sewer, Morrison Knudson & Sons, low bidder.
- 700 Tons, Sioux Falls, S. D., hospital for Veterans Administration.
- 205 Tons, Chicago, building for Derby Foods
- • Railroad car inquiries this week included the following: Mis-

souri Pacific Ry. has been authorized by the U.S. District Judge Moore at St. Louis to purchase the following equipment: For Missouri Pacific-600 50-ton auto box cars, \$3,150,000; 500 50-ton box cars, \$2,350,000; 500 70-ton hopper cars, \$2,050,000; 50 65-ft mill type gondolas, \$275,000; and 50 70-ton covered hopper cars, \$265,000. For International-Great Northern-50 50-ton auto box cars, \$262,500; 50 40-ton single deck stock cars, \$205,000; 50 70-ton covered hoppers, \$265,000. For New Orleans, Texas & Mexico-50 50-ton auto box cars, \$262,500; 300 50-ton box cars, \$1,410,000.

Passenger equipment authorized is as follows: For Missouri Pacific-two sleeping cars, \$270,000 and one diner lounge, \$114,600. For International-Great Northern -one baggage dormitory car, \$65,-200; one astra-dome coach, \$140,-000; two coaches, \$181,240; one diner lounge, \$114,600, and one 2000 hp diesel locomotive, \$203,-

To Negotiate Contract With Harman Company For 10.000 Steel Houses

Washington

• • • Instituting its second guaranteed market, NHA has issued a directive to RFC calling for the negotiating of such a contract with the William H. Harman Corp. of Philadelphia for the production of 10,000 factory-built steel houses for sale to veterans.

It is estimated that from 32,000 to 35,000 tons of steel will be required for construction. Eight types of one-story houses will be built, divided almost equally between two and three-bedroom homes, costing about \$5,000 and \$6,500 each when erected, but not including cost of a lot.

The firm plans to get its Fullerton, Pa., plant into production in December with an initial output of 50 houses, stepping it up to a peak of 1000 a month by May. While the contract will run to Dec. 31, 1947, the guarantee will extend to the following June for units started but not completed because of circumstances beyond control of the builder.

Panels of the house will be made of steel channels and steel sheets for the walls, roof and partitions, with gypsum wallboard as an interior finish. Windows will be of the steel or aluminum casement type. The two-bedroom house will require 6700 lb of metal and the three-bedroom type about 8200 lb.

Factory prices for the two-bedroom models range from \$2,925 to \$2,965; for the three-bedroom, from \$3,352 to \$3,672. These f.o.b. prices, it was said, constitute about half the erected costs.

As an incentive for reducing costs, the producer will be permitted to retain one-third of the savings resulting from mass production with the remaining two-thirds to be granted the buyer. Provision is also made for adjustments to reflect changes in wage scales or material cost.

EASY ON THE EYE: Here is the handsome Harman house in a three-bedroom model which offers the possibility of a decent low cost home for the veteran next year. In addition to using steel structural members the walls, roof and partitions are of steel sheet. The interior is finished in gypsum wallboard and the dwelling is insulated.



MACHINE TOOLS

. . . News and Market Activities

WAA Pricing Policy Draws Diverse Views

• • • Reactions of machine tool builders and dealers blew alternately hot and cold to War Assets Administrator Robert M. Littlejohn's announcement of a new pricing program which removes 60 to 70 pct of all government-owned machine tools from Clayton formula regulation and places about \$350,000,000 worth of machine tools on sale immediately on a fixed price basis.

Adding fuel to the fire was a meeting of the Metalworking Equipment Industry Advisory Committee, called on 3-day notice, which has been opposed to the new pricing program since its start as

a rumor.

Some machine tool builders were inclined to agree that cutting prices on those tools in long supply in the surplus would serve to dry the surplus up sooner than continuance of the Clayton formula. Others interpreted WAA's move as another kick in the teeth to the

Details of the WAA plan to sell \$350 million in machine tools on a low fixed price basis appear on p. 113.

industry, charging that it affects the market for new tools and discourages buying from the surplus at the same time because buyers will wait for prices on the government-owned equipment to go still

Dealers felt the new program will, in some cases, tend to cut the ground out from under a new order, because of the vague listings, and also that speculation buying

may easily result.

In effect, WAA's move will require some machine tool builders to surpass, in their new designs, machines in the surplus by the widest possible margin. The price differential has suddenly become incommensurably greater. while all this will work to the good of the machine tool user, the industry has already been feeling the pinch of the surplus; lower prices will make it worse.

Some segments of the industry are also watching the foreign situation with a little trepidation. UNRRA is running out, and there are difficulties over the rate of exchange which threaten to some extent the foreign order picture, and the 25 pct approximately which this business constitutes in the industry's total.

With WAA rapidly turning the surplus machine tool disposal program into a bargain basement, Civilian Production Administration's announcement of special restriction to prevent the use by other persons of veterans' preference ratings was something of a coincidence.

Direction 20 to priorities regulation 28 points out that CPA assigns preference ratings under PR-28 for the assistance of veterans who seek to establish busi-CPA's announcement nesses. makes the admission that "it appears that in some cases veterans are being used as 'fronts' by presently established firms and other persons who are not eligible for rating assistance."

The new direction provides that CC ratings may be issued to veterans to obtain equipment to establish new business only under all the following circumstances: the veterans or group of veterans will actively control the business by having at least a 50 pct interest in the profits and by all being actively engaged in the operation of the business; the equipment will be installed in premises which the veterans, or the corporation or partnership they control, own or lease, or have made definite arrangements to buy or lease; and the premises where the equipment is installed are separate from the premises of any established business in the same line.

In Cincinnati, while no change in the overall demand picture is noted, machine tool buying interest still indicates a substantial potential market. Currently, visitors from all parts of the world, including Sankalchand G. Shah, vice-president of the All-India Manufacturers' Organization, are reported at various plants in this area, attempting to determine what purchases to make. Foreign ordering, however, is still hovering around 40 pct of bookings, although total ordering is still not up to the broad proportions of earlier this year. Some hesitancy from doubt as to the labor situation is reported and material stringencies are also deterring broader demand. Shipments for the most part are close to production and backlogs are slowly diminishing.

In Boston and the East, in sharp contrast, more and more builders and their representatives are reporting a pick-up in business. Sales are running very largely to small metal working concerns. Thus, individual bookings do not run into big money. However, transfers of milling machines, fairly expensive lathes and a good variety of other tools costing less are noted. The fact that weekly sales are increasing, as are the number of quotations put out and the number of inquiries, are all encouraging to the local trade.

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WAA Classifies Surplus Equipment for Schools

Washington

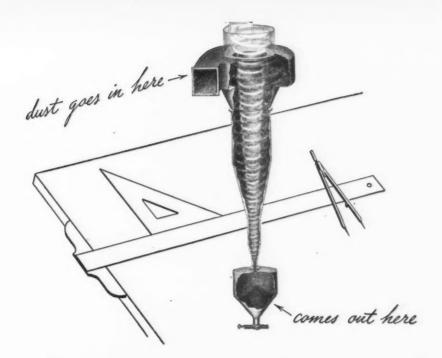
· · Following up his announcement last week that surplus tools and equipment would be made available to eligible educational institutions at approximately a 95 pct discount, WAA Administratrator Littlejohn has revealed that this material falls roughly into 11 general classes.

Under the program the following broad categories of tools and equipment are to be made avail-

able:

Electrical; woodworking; metalworking; business machines; heating; communications and electronic devices; office, school, auditorium, factory and laboratory furniture; optical instruments and appartus; indicating, recording and controlling instruments and accessories; professional and scientific instruments; and, engineering instruments and appara-

128-THE IRON AGE, October 17, 1946



Man-Made Tornado

Take any industrial plant that has a nuisance problem. Apply an American Blower Dust Collector. Presto! Your problem is solved. The manmade tornado action in these collectors does just this, easily and effectively.

Material can be separated from air or gases, too, in industries where it is worth salvaging, with these time-proved American Blower products. These collectors have already proved their merit collecting grain dust, coal dust, ore roaster dust, cement dust, soap dust, and a long list of other materials from air.

Phone your nearest American Blower Branch for information on putting these collectors to work

for you. Ask also about the complete line of American Blower Air Handling Equipment and be sure to investigate Gýrol Fluid Drive for the smooth transmission of power and stepless variable speed control.



AMERICAN BLOWER

AMERICAN BLOWER CORP., DETROIT 32, MICH.

Division of American Radiator & Standard Sanitary Corporation

4 Years of War-Stimulated Improvement—On Top of 61 Years of Engineering Development



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Heating Equipment



Ventilating Equipment



Gyrol Fluid Drive



Industrial Fans



Air Conditioners

NONFERROUS METALS

. . . News and Market Activities

Tin Committee Makes Recommendations For Last Half Allotments

Washington

• • • The Combined Tin Committee has recommended tin allocations totaling 18.055 tons for the second half of 1946. As usual, the United States was listed for the largest allocation, amounting to 6400. France came second with 4000. Allocations for the first six months were about 25,000 tons.

Most of the allocations are on an interim basis, the Committee pointed out, with a further review of the tin situation probable in early November.

Specific allocations recommended for the last half of the current year are as follows:

year are as ronows.	
CHILDS COMOD TITTITITITITITITITITITITITITITITITITIT	6400
	1000
	2000
	1200
Italy	800
Switzerland	640
Czechoslovakia	600
Poland	360
Denmark	240
Austria	200
Brazil	200
Egypt	175
Yugoslavia	160
Latin American countries (not else-	
where specified)	150
Norway	120
Finland	120
Greece	80
Hong Kong	75
Argentine	70
Argentina	40
Ceylon	25
Chile	
Iran	25
Mexico	25

Details of the allocations for the Middle East (excluding Egypt and Iran) and the Latin American countries not specified will be made available later.

The Committee said that the tin will come from Belgian, British or Dutch sources, plus some from South Africa and also from Japanese stocks held in the United States. For the Latin American countries, however, the United States is an additional source for

very limited quantities and supplies will also be available to France from French Indo-China and to the United States from China.

The Japanese stocks were discovered by military occupation forces and shipped to the United States for inspection and sorting prior to allocation by the Combined Tin Committees.

Grant Increases On Primary, Scrap Zinc

Washington

• • • Under the "world price" provision of the OPA Extension Act, the agency has announced a price increase of one cent a pound in ceiling prices of primary slab zinc, effective Oct. 14.

At the same time OPA announced increases on: Secondary slab zinc, 1¢ a pound; zinc scrap, 3/4¢; leaded zinc oxides, 1¢ if containing 35 pct or more of lead, 34¢ if containing less than 35 pct; lead-free oxides, 3/4; rolled zinc products, 1¢ a pound.

Dealer premium differentials on sales of less than carload lots of primary and secondary slab are increased by the same percentage for each quantity bracket; resellers of zinc oxides and rolled zinc may add their average percentage mark-ups to the new costs.

NEW ZINC CEILING PRICES

Cents per Pound

Prime	West	er	n											9.25
Selected	١													9.35
Brass S	Specia	al												9.50
Interme	ediate													9.75
High (Frade													10.25
Special	High													

New zinc clippings, trimmings	8.00
Engraver-Lithographer plates	8.00
Old zine scrap	6.50
Unsweated zinc dross	6.55
Die cast slab	6.55
New die cast scrap	5.70
Forming and stamping dies	5.70
Radiator grilles, old or new	5.70
Old die cast scrap	5.25

Nonferrous Metals Prices

Cents per pound

	Oct 9	Oct. 10	Oct. 11	Oct. 12	Oct. 14	Oct. 15
Copper. electro Conn	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake. Conn	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York	52.00	52.00	52.00		52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25	9.25	9.25
Lead, St. Louis	8.10	8.10	8.10	8.10	8.10	8.10

See 1947 Tin Shortage

• • • The International Tin Conference which ended here last week predicts 142,000 tons production in 1947 against an annual world consumption with controls gone of 192,000 tons. The conference recommends the establishment of an international tin study group without comment on end of international tin agreement.

Raise Copper Shape Tolls

Washington

• • • Premiums and toll charges for converting or casting refined copper in special shapes have been given increases ranging from \$2 to \$4 by OPA effective Oct. 14. Where toll charge premiums in effect on Aug. 11, 1941 were \$1 to \$3.50, an increase of \$2 has been granted. Where these charges and premiums were over \$3.50 per ton, the increase is \$4.

OPA pointed out that since the increases are averages and some services may still result in losses it may grant individual adjustments for casting services under toll agreements. These will be given, OPA said, when it appears that the new ceiling prices for standard or special shapes under toll agreements impede these services and the services are essential.

Lead Allocations High

Washington

• • • Storage batteries are given preference in CPA's fourth quarter allocations of lead in which users are permitted the following quantities (in thousands of tons):

Batteries	S												*					٠		51.4
Chemica	ls																×			31
Cable c	OW	ari	n	30																28
aching																				10
Sheet at	ħα	n	in	A																12
Tetraeth	yl															*		٠	8	
Ammuni	tic	n										×		×		*				8
Brass &	B	ro	na	ze		. ,														8
Type Me	eta	ıl									×				×	٠				8
Bearing	1	Me	ta	1														,		7
Collapsi	ble	t	ul	oe	S														0	3.3
Export																		*	×	0.3
Reserve	fo	r	aj	pr	e	a	18	3 .												3
All othe	r																		*	20.5
Total																				

point Aluminu Antimor Berylliu dollar dollar Berylliu lars I Cadmiu Cobalt, Copper, Copper, Copper, Gold, U

Gold, U Indium, Iridium, Lead, S Lead, M Magnes Magnes Mercury f.o.b. Nickel, Palladiu Palladia Platinun Silver, Tin, Str Zinc, E Zinc, N Zirconiu conta

(Cents

Alumint

Alumin Piston AXS 67 Alumin

Copper Copper Copper Low be the Ked be Naval Brass, Comme Manga: Phosph B, 5 Muntz Everdu Olym Nickel Archite

Drau in. wa 71¢: ba

Primary Metals

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(Cents per lb, unless otherwise noted)
Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)
Aluminum pig, f.o.b. shipping point 14.00 Antimony, American, Laredo, Tex. 14.50 Beryllium copper, 3.75-4.25% Be;
dollars per lb contained Be\$14.75 Beryllium aluminum, 5% Be; dol-
lars per lb contained Be\$30.00 Cadmium, del'd \$1.25
Cobalt, 97-99% (per lb)\$1.50 to \$1.57 Copper, electro, Conn. Valley14.375
Copper, electro, New York14.125 Copper, lake, Conn. Valley14.375
Gold, U. S. Treas., dollars per oz. \$35.00 Indium, 99.8%, dollars per troy oz. \$2.25
Iridium, dollars per troy oz\$125.00 Lead, St. Louis
Lead, New York 8.25 Magnesium, 99.9 + %, carlots 20.50 Magnesium, 12-in. sticks, carlots 27.50
Mercury, dollars per 76-lb flask, f.o.b, New York\$96 to \$99
Nickel, electro, f.o.b. refinery 35.00 Palladium, dollars per troy oz \$24.00
Platinum, dollars per troy oz\$80.00 Silver, New York, cents per oz 90.125
Tin, Straits. New York 52.00
Zinc, New York 9.69 Zirconium copper, 6 pct Zr, per lb
contained Zr\$ 6.00

Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2)	14.00
Piston alloys, No. 12214.00 to	14.25
AXS 67914.25 to	14.50
Aluminum, deoxidizing	
No. 4	13.50
Brass Ingot—ceiling prices	
85-5-5-5 (No. 115)	
	19.00
80-10-10 (No. 305)	18.50
No. 1 Yellow (No. 405)	12.75

Copper, Copper Base Alloys

(Mill base, cents per 1b)

	Tab.	xtruded		
		shapes		Sheets
Copper		25.66		25.81
Copper, H.R.			22.16	
Copper drawn			23.16	
Low brass, 80%			24.35	24.66
High brass				23.67
Red brass, 85%			24.67	24.98
Naval brass		23.84	22.59	28.53
Brass, free cut			18.53	
Commercial, bronze			25.50	25.81
Manganese bronze		27.45	25.95	32.03
Phosphor bronze,	A,			
В, 5%			43.70	43.45
Muntz metal		23.59	22.34	26.78
Everdur, Herculoy,				
Olympic or equal			29.82	30.88
Nickel silver, 5%			34.44	32.33
Architectural bronze	8.	22.50		

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢, 52S-O, 67¢ 24S-T, 71¢: base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30.000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 38, 26¢; 148, 32.5¢; 248, 35¢; 538, 618, 28¢; 638, 27¢; 758, 45.5¢; base, 30.000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢: 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; hase, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in. (Continued, See Next Column)

diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 22.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb: 25 to 90 lb, 56¢: less than 25 lb, 66¢.

NONFERROUS SCRAP METAL QUOTATIONS

†(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality. quantity and special preparation premiums—other prices are current quotations)

Copper, Copper Base Alloys

OPA	Group	7+

No. 1 wire, No. 1 heavy copper No. 1 tinned copper wire, No. 1	11.50
tinned heavy copper	11.50
	10.50
Copper tuyeres	10.50
Light copper	9.50
Copper borings, No. 1	11.50
No. 2 copper borings	
Lead covered copper wire, cable	
Lead covered telephone, power	
cable	*
Insulated copper	

OP 4 C---- 94

High grade bronze gears	r A Group 2	
High grade bronze gears	ell metal 17.	25
High grade bronze solids Low lead bronze borings Babbitt lined brass bushings High lead bronze solids High lead bronze borings Red trolley wheels Tinny (phosphor bronze) borings Tinny (phosphor bronze) borings Tinny (phosphor bronze) solids Tinny (phosphor bronze) lids Toring metal turnings Toring metal turnings Toring metal solids Tunlined standard red car boxes Tocks and faucets Mixed brass screens Ted brass breakage Old nickel silver solids Old nickel silver borings Topper lead solids, borings Yellow brass castings Automobile radiators		
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Yellow brass castings	d nickel silver borings 7.	50
Automobile radiators	opper lead solids, borings 6.	75
Automobile radiators	ellow brass castings 7.	.50
Zincy bronze solids, borings	utomobile radiators 8.	78
	ncy bronze solids, borings 9.	.75
	The state of the s	

OPA Group 3†

Fired rifle shells	9.50
Brass pipe	8.75
Old rolled brass	8.25
Admiralty condenser tubes Muntz metal condenser tubes	8.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.65
Manganese bronze solids	6.65
Manganese bronze borings	6.90

UPA Gr	oup 4	1									
Refinery	brass										6.00*

*Price varies with analysis. 1 Lead content 0.00 to 0.40 pct. 1 Lead content 0.41 to 1.00 pct.

Brass Mill Scrapt

Briquetted	cartridge	brass	turn-	
				10.375
	brass turni			9.625
Loose yell	ow brass t	rimming	S	9.625

Aluminum

Plant scrap, segregated

2S solids	
Dural alloys, solids 14, 17, 18.	
24S, 25S 8.50 to 9.00	
turnings, dry basis 7.50 to 8.00	
Low copper, alloys 51, 52, 61,	
63S solids 9.50 to 10.00	
turnings, dry basis 8.50 to 9.00	

riant scrap, mixea	
Solids	8.50
Turnings, dry basis	7.50
Obsolete scrap	
Old sheet and utensils Old castings and forgings 8.50 to	9.50
Pistons, free of struts	8.50

Magnesium*

Segregated	plant scrap		
Pure solids	and all other	solids,	exempt
Borings and	turnings		1.50

Mixed, contaminated plant scrap

Grade	1	solids .							3.00
Grade	1	borings	and	turning	S	0	0		2.00
Grade	2	solids .							2.00
Grade	2	borings	and	turning	S			0	1.00

^{*}Nominal.

Zinct

New zinc clippings, trimmings	8.0
Engravers, lithographers plates	8.0
Old zine scrap	6.1
Unsweated zinc dross	6.
Die cast slab	6.
New die cast scrap	5.
Forming and stamping dies Radiator grilles, old and new	5.
Old die cast scrap	5.

Lead

Deduct 1.40¢														
basing point pr			r	re	file	ne	er	y	(ì	18	T	ge.	on
used battery pl													-	
Soft lead scrap		0 8										9	7	.50

Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Co	pper, frt, allowed	
-	Cast, oval, 15 in. or longer	29.75
1	Electrodeposited	23.47
	Rolled, oval, straight, delivered	23.72
	Curved, 18 in. or longer, delivered	23.72
	ass, 80-20, frt allowed	
	Cast, oval, 15 in. or longer	27.25
	nc, cast, 99.99	
	cker, 99 pct plus, frt allowed	
(Cast	47
	Rolled, depolarized	48
	lver, 999 fine	
	Rolled, 1000 oz lots, per oz	93 1/3

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cya	nide, 1-5	bbls		34.00
Copper subbls	lphate,	99.5,	crystals,	7.75
Nickel sali	ts, single	, 425	lb bbl:	13.50
Silver cyan	ide, 100	oz lots	per oz.	0.74
Sodium cya 125 lb	anide, 96 drums			15.00
Zinc cyanic	de, 100 lb	drum	s	33.00
Zine sulph	allowed			

THE IRON AGE. October 17, 1946-131

Shipments Continue at Dull Pace

New York

• • • "The patient," said one wag in speaking of the scrap situation, "is doing as well as can be expected. Though holding his own at the moment the onset of cold weather will undoubtedly mean a turn for the worse."

Aside from efforts to stimulate shipbreaking, an operation not expected to have any important impact on this Winter's operations, the government appears to have somewhat relaxed its grip on the industry. Many observers believe that continuation of a hands-off policy is the best thing scrap traders and steel makers can ask for at the present time.

A plea to return "tremendous tonnages of scrap iron and steel" from the battlefields was made this week by Robert W. Wolcott, president, Lukens Steel Co., and chairman of the American Iron & Steel Institute's committee on iron and steel scrap. Returns of iron and steel battlefield scrap from Europe totaled about 80,000 tons in 1944, 37,000 tons in 1945 and have been averaging less than 5,000 tons a month this year.

PITTSBURGH—Scrap shipments into this area are sharply reduced because the power strike has practically stopped yard operation and the generation of scrap in fabricating plants. Indications are that a large portion of the cast scrap being sold is going at clean motor block prices. Mills in the district are getting only about 50 pct of their current needs, and the bulk of this is moving in from out of the district.

CHICAGO—Nobody is getting enough scrap but nobody is shutting down openhearths for lack of it. Experienced observers, however, still insist the time to worry about Winter operations is now and the popular notion that the industry can somehow manage without scrap inventories is full of fallacies. These same people, however, will agree that by a reduction in operating rates it would be possible to get through the winter without any improvement in scrap market conditions.

PHILADELPHIA—Mills in this area are continuing to operate on a day-by-day basis for want of scrap. There are many evidences of irregularity in pricing and in effect the price of scrap has been raised by \$2.50 per ton since it is reported

that any mill desiring a low phos authorization can obtain it. Consumption of so-called low phos in the openhearth has made it unnecessary for the yards to cut to smaller than charging box size which is creating a hardship on electric furnace melters.

DETROIT — If anything, the scrap situation here appears to be growing tighter as the spurt in scrap flow which followed the OPA price ruling has steadily diminished. The recent 30-pct reduction in the Chrysler operating rate will reduce substantially a scrap generation volume that some dealers already feel is unexplainably low. There are no indications here that any appreciable volume of cast iron scrap has come out in response to the recent price increase. The verdict on cast iron seems to be that there just isn't enough available at prices even close to those now in effect.

CLEVELAND—Clamor for a review of the scrap price case is growing as practically all shipments are now on an "allocation" basis. Overall shipments are actually not as bad as they appear, but the spread is very thin, with scrap moving from one area to another, because of the present situation. Many of the allocations are not Washington allocations, but rather, instructions from the man who owns the scrap. Tie-in sales and overgrading to a very considerable extent have been reported, and less tonnage is coming into many yards. The shortage in Youngstown is acute.

BOSTON—Everybody is back in the upgrading game again. With scrap short and buyers hungry there is no reason why sellers shouldn't upgrade inasmuch as the OPA left the door open for so doing. Bids for all Navy unprepared scrap offered recently were above ceiling; rejected, then reconsidered. A Rhode Island lot, mostly second hand material, sold to a South Boston interest at \$33.65 a ton, his total bid being \$10,000 higher than the second highest. Cast, extremely short, is still bootlegged. Highest price reported paid this week was \$40 a ton for a small trucklot.

NEW YORK—The patient, according to dealers and brokers here, is "doing as well as can be expected." Many dealers who waxed wealthy during the war don't find it urgent to scrounge around for a few tons here and there but they are moving material at a rate just about sufficient for current needs but not enough for stockpiling. Some dealers are still having trouble with non-delivery of small lots due to the trucking strike here, though their own trucks are no longer affected.

BUFFALO — Concern over the scrap shortage has given way to frank worry in the local trade and predictions of steel curtailment are being measured in weeks instead of months. Because of blast furnace failure, one leading consumer has brought in 10,000 tons of steelmaking grades of pig iron from Ohio to maintain production. In normal times this gap would be filled by scrap. Allocation of pig iron has aggravated the cast scrap situation. Foundries are putting on the pressure for deliveries and the market is reported bare as a bone.

No. 1 RR. No. 1 Rails No. 1 Hand Hvy. Mach Short Mixed Cast No. 1 Char, Heav Burn Malle RR. RR. RR. RR.

No. 1 No. 2 No. No. 8 Bund Galv. Mach Short Cast Mix. Low Low No. 1 Reroi Misce Angle

Cut be Stand No. Coup Malle No. Rails

No. Hvy. RR. Cast Stove Clear Cast

No.
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CINCINNATI—Scarcity in cast scrap in this area continues to be acute, although dealers and brokers are spreading available tonnage, and thus keeping foundries operating. Melters of steel scrap are pressing for heavier shipments in a desire to increase inventories, but lack of plentiful supply makes it impossible to satisfy requests. There is an indication of an improvement in production scrap, but so far, this has not affected the local market.

ST. LOUIS—Shipments of scrap iron to the St. Louis industrial district continue small and mills are compelled to dig into their ground inventories. The movement of industrial scrap is light despite the efforts of the Chamber of Commerce to stimulate it. Railroad shipments are thin and are allocated before the dealer handles them.

BIRMINGHAM — Shipments of steel scrap are showing little increase in volume in this area but trade sources report that some tonnages being unloaded at New Orleans are moving to Northern mills from Cuba and South America. Demand for cast grades here continues to exceed supplies.

TORONTO—Serious shortages in scrap iron and steel supply continue to feature Canadian markets. Dealers states that receipts are running less than 25 pct of requirements and most yards are out of stocks. Industrial scrap has almost disappeared from the market, and only small lots are reaching dealers from rural districts. The ending of the steel strike has resulted in resumed deliveries of steelmaking scrap to the mills at Hamilton and Sault Ste. Marie, and most of scrap passing through dealers' hands is light baling material.

MILWAUKEE—While accurate figures are not available a good estimate puts local daily shipments at about 700 tons with no signs of an increase due to the stymied situation under OPA regulations. As one local dealer put it, "The scrap peddler can't make any money today under OPA and has been practically eliminated. If price controls were off there would be more of an incentive to round up scrap without any great increases in prices." Most dealers argue that labor and production costs have advanced to where it amounts to running the scrap business at a continual loss.

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PITTSBURGH		
	Going prices as obtained in the trade	Hvy. breakable cast 20.00° Charging box cast 21.00°
Per gross ton delivered to consumer:	by IRON AGE editors, based on rep-	Stove plate 21.00*
Cast grade f.o.b. shipping point	resentative tonnages. Where asterisks	Clean auto cast 27.00°
No. 1 hvy. melting \$20.00° RR. hvy. melting 21.00°	are used they indicate the OPA	Unstrip. motor blks 20.00* Cl'n chem. cast bor 14.33*
No. 2 hvy. melting 20.00*	ceiling price to which must be added	
RR. scrap rails	brokerage fee and adjusted freight.	BUFFALO
No. 1 comp'd sheets 20.00*		Per gross ton delivered to consumer: Cast grades f.o.b. shipping point
Hand bdld. new shts 20.00* Hyy, axle turn 19.50*	Control to the second	No. 1 hvy. melting \$19.25°
Hvy. steel forge turn 19.50*	Mixed bor. & turn 13.32*	No. 1 bundles 19.25*
Mach. shop turn 15.00* Short shov. turn 17.00*	Low phos. plate 1982.	No. 2 bundles
Mixed bor. and turn 15.00*	No. 1 cupola cast 25.00* Charging box cast 21.00*	Mach. shop turn 14.25°
Cast iron borings 16.00* No. 1 cupola cast 25.00*	Hvy. breakable cast 20.00*	Shoveling turn 16.25° Cast iron borings 15.25°
Charging box cast 21.00*	Stove plate	Mixed bor. & turn 14.25°
Heavy breakable cast 20.00* Burnt cast 17.75*		No. 1 cupola cast 25.00* Charging box cast 21.00*
Malleable 24.00*	PHILADELPHIA	Stove plate 23.00*
RR. knuck, and coup 24.50* RR. coil springs 24.50*	Per gross ton delivered to consumer:	Clean auto cast
Rail leaf springs 24.50°	Cast grades f.o.b. shipping point	Low phos. plate 21.75°
Rolled steel wheels 24.50° Low phos 22.50°	No. 1 hvy. melting \$18.75* No. 2 hvy. melting 18.75*	Scrap rails 20.75* Rails 3 ft. & under 22.75*
bow phote	No. 2 bundles 18.75*	RR. steel wheels 23.75°
CHICAGO	Mach. shop turn 13.75° Shoveling turn 15.75°	Cast iron carwheels 22.00° RR. coil & leaf spgs 23.75°
Per gross ton delivered to consumer:	Cast iron borings 14.75*	RR. knuckles & coup 23.75*
Cast grades f.o.b. shipping point	Mixed bor. & turn 13.75* No. 1 cupola cast 25.00*	No. 1 busheling 19.25*
No. 1 hvy. melting \$18.75*	Hvy. breakable cast 20.00*	CLEVELAND
No. 2 hvy. melting 18.75* No. 1 bundles 18.75*	Clean auto cast 21.00*	Per gross ton delivered to consumer:
No. 2 dealers' bndls 18.75*	Hvy. axle forge turn 18.25*	Cast grades f.o.b. shipping point
Bundled mach. shop turn 18.75* Galv. bundles 16.75*	Low phos. plate 21.25° Low phos. punchings 21.25°	No. 1 hvy. melting \$19.50° No. 2 hvy. melting 19.50°
Mach. shop turn 13.75*	RR. steel wheels 23.25*	Compressed sheet stl 19.50°
Short shovels, turn 15.75* Cast iron borings 14.75*	RR. coil springs 23.25*	Drop forge flashings 19.00 No. 2 bundles 19.50*
Mix. borings & turn 13.75*	RR. malleable 22.00°	No. 2 bundles 19.50° Mach. shop turn 14.50°
Low phos. hvy. forge 23.75* Low phos. plates 21.25*	ST. LOUIS	Short shovel 16.50°
No. 1 RR. hvy. melt 19.75*	Per gross ton delivered to consumer:	No. 1 busheling 19.50° Steel axle turn 19.00°
Reroll rails 22.25*	Cast grades f.o.b. shipping point	Cast iron borings 15.50°
Miscellaneous rails 20.25° Angles & splice bars 22.25°	Heavy melting \$17.50* Bundled sheets 17.50*	Mixed bor. & turn 14.50° No. 2 busheling 17.00°
Locomotive tires, cut 24.25*	Mach. shop turn 12.50*	No. 1 machinery cast 25.00°
Cut bolsters & side frames 22.25* Standard stl. car axles 25.75*	Locomotive tires, uncut	Malleable
No. 3 steel wheels 23.25*	Misc. std. sec. rails 19.00° Rerolling rails 21.00°	Railroad grate bars 20.00*
Couplers & knuckles 23.25* Malleable 24.00*	Steel angle bars 21.00*	Stove plate 23.00°
No. 1 mach. cast 20.00*	Rails 3 ft and under 21.50* RR. springs 22.00*	RR. hvy. melting 20.50* Rails 3 ft. & under 23.00*
Ralls 3 ft. and under 22.25*	Steel car axles 24.50*	Rails 18 in. & under 24.25*
No. 1 agricul. cast 20.00* Hvy. breakable cast 20.00*	Stove plate 23.00*	Rails for rerolling 23.00° Elec, furnace punch 22.00°
RR. grate bars 15 25*	Brake shoes	Elec. Iurnace punch
Cast iron brake shoes 17.75° Stove plate 23.00°	Malleable 24.00*	SAN FRANCISCO
Clean auto cast 27.00*	Cast iron carwheels 22.00* No. 1 mach'ery cast 22.00*	Per gross ton delivered to consumer:
Cast iron carwheels 22.00	Breakable cast 20.00*	Cast grade f.o.b. shipping point
		RR. hvy, melting \$18.00*
CINCINNATI	RIRMINGHAM	No. 1 hvy. melting 17.00*
CINCINNATI	BIRMINGHAM	No. 2 hvy. melting 17.00*
Per gross ton delivered to consumer:	BIRMINGHAM Per gross ton delivered to consumer: Cast grades f.o.b. shipping point	No. 2 hvy. melting 17.00* No. 2 bales 17.00*
Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting	Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting \$17.00°	No. 2 hvy. melting 17.00° No. 2 bales 17.00° No. 3 bales 15.00° Mach. shop turn 12.00°
Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting	Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting	No. 2 hvy. melting 17.00° No. 2 bales 17.00° No. 3 bales 15.00° Mach. shop turn 12.00° Elec, furn. 1 ft. und. 19.50°
Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting	Per gross ton delivered to consumer:	No. 2 hvy. melting 17.00° No. 2 bales 17.00° No. 3 bales 15.00° Mach. shop turn. 12.00° Elec, furn. 1 ft. und. 19.50° No. 1 cupola cast. 25.00°
Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting \$19.50° No. 2 hvy. melting 19.50° No. 1 bundles 19.50° No. 2 bundles 19.50° Mach. shop turn 210.50°	Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting \$17.00° No. 2 hvy. melting 17.00° No. 2 bundles 17.00° No. 1 busheling 17.00° Long turnings 12.00°	No. 2 hvy. melting 17.00° No. 2 bales 17.00° No. 3 bales 15.00° Mach. shop turn 12.00° Elec, furn. 1 ft. und 19.50° No. 1 cupola cast 25.00°
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Per gross ton delivered to consumer: Cast grades f.o.b. shipping point No. 1 hvy. melting \$19.50° No. 2 hvy. melting 19.50° No. 1 bundles 19.50° Mach. shop turn. \$10.50 to 11.00 Shoveling turn. 12.50 to 13.00 Cast iron borings 11.50 to 12.00 Low phos. plate 22.00° No. 1 cupola cast. 25.00° Hy. breakable cast. 20.00° Serap rails 21.00° BOSTON Dealers' buying prices per gross ton. f.o.b. cars No. 1 hvy. melting \$15.05° No. 2 hvy. melting 15.05° Nos. 1 and 2 bundles 15.05° Busheling 15.05° Machine shop turn. 10.05° Mixed bor. & turn. 10.05° Breakable cast. 25.00° No. 2 machinery cast. 25.00° Breakable cast. 20.00° Stove plate 23.00° DETROIT Per gross ton, brokers' buying prices: No. 1 hvy. melting 317.32° No. 1 hvy. melting 17.32°	Per gross ton delivered to consumer:	No. 2 hvy. melting

Comparison of Prices .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound) Hot-rolled sheets Cold-rolled sheets (24 ga.)	Oct.15, 1946 2.425 3.275 4.05	Oct. 8, 1946 2.425 3.275 4.05		Oct. 16, 1945 2.20 3.05 3.70	Pig Iron*: Oct. 15, (per gross ton) 1946 No. 2 foundry, Phila\$30.43 \$No. 2, Valley furnace 28.50 No. 2, Southern, Cin'ti 27.80 \$24.80
Hot-rolled strip 6-in and under Over 6 in. Cold-rolled strip Plates Plates, wrought iron Stain's c-r strip (No. 302)	2.45 2.35 3.05 2.50 4.112 30.30	2.45 2.35 3.05 2.50 4.112 30.30	2.45 2.35 3.05 2.50 4.112 30.30	2.10 2.10 2.80 2.25 3.80 28.00	No. 2, Birmingham
Tin and Ternplate: (dollars per base box) Tinplate, standard cokes Tinplate, electro (0.50 lb) Special coated mfg. ternes Bars and Shapes:	\$5.00 4.50 4.30	\$5.00 4.50 4.30	\$5.00 4.50 4.30	\$5.00 4.50 4.30	† The switching charge for delivery cago district is 60¢ per ton. ‡ For carlots at seaboard. Prices retroactive to May 29; the reflected in The Iron Age Comparium 4.
(cents per pound) Merchant bars Cold-finished bars Alloy bars Structural shapes Stainless bars (No. 302). Wrought iron bars Wire and Wire Products:	2.50 3.10 2.92 2.35 25.97 4.76	2.50 3.10 2.92 2.35 25.97 4.76	2.50 3.10 2.92 2.35 25.97 4.76	2.25 2.75 2.70 2.10 24.00 4.40	Scrap: (per gross ton) Heavy melt'g steel, P'gh.\$20.00 Heavy melt'g steel, Phila. 18.75 Heavy melt'g steel, Ch'go 18.75 No. 1 hy. comp. sheet, Det. 17.32 Low phos. plate, Youngs'n 22.50 No. 1 cast, Pittsburgh 25.00
(cents per pound) Bright wire Wire nails	3.05 3.75	3.05 3.75	3.05 3.75	2.75 2.90	No. 1 cast, Philadelphia. 25.00 No. 1 cast, Chicago 25.00
Rails: (dollars per net ton) Heavy rails Light rails *per gross ton	\$43.39 49.18	\$43.39 49.18	\$43.39 49.18	\$43.00* 45.00*	
Semifinished Steel: (dollars per gross ton) Rerolling billets Sheet bars Slabs, rerolling Forging billets Alloy blooms, billets, slabs	38.00 39.00 47.00	\$39.00 38.00 39.00 47.00 58.43	47.00	\$36.00 36.00 36.00 42.00 54.00	Nonferrous Metals: (cents per pound to large buyers Copper, electro., Conn 14.375 Copper, Lake, Conn 14.375 Tin, Straits, New York 52.00 Zinc, East St. Louis 9.25 Lead, St. Louis 8.10
Wire Rods and Skelp: (cents per pound) Wire rods Skelp	2.30 2.05	2.30 2.05	2.30 2.05	2.15 1.90	Aluminum, virgin 15.00 Nickel, electrolytic 35.00 Magnesium, ingot 20.50 Antimony, Laredo, Tex 14.50 Starting with the issue of Apr. 22, 1941

Pig Iron*:	Oct. 15,		Sept. 10,	
(per gross ton)	1946	1946	1946	1945
No. 2 foundry, Phila\$	30.43	\$30.43		\$26.84
No. 2, Valley furnace 2	28.50	28.50	28.50	25.00
	27.80	27.80	27.80	25.44
No. 2, Birmingham	24.88	24.88	24.88	21.38
No. 2 foundry, Chicago; . 2	28.50	28.50	28.50	25.00
Basic, del'd eastern Pa	29.93	29.93	29.93	26.34
Basic, Valley furnace	28.00	28.00	28.00	24.50
	28.50	28.50	28.50	25.00
Malleable, Valley	28.50	28.50	28.50	25.00
	42.34	42.34	42.34	42.34
Ferromanganeset13	35.00	135.00	135.00	135.00
June 4.				
Scrap:				
(per gross ton)				
Heavy melt'g steel, P'gh.\$		\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.		18.75	18.75	18.75
	18.75	18.75	18.75	18.75
	17.32	17.32	17.32	17.32
	22.50 .	22.50	22.50	22.50
	25.00	25.00	20.00	20.00
	25.00	25.00	20.00	20.00
No. 1 cast, Chicago	25.00	25.00	20.00	20.00
Coke, Connellsville:				
(per net ton at oven)				
	\$8.75	\$8.75	\$8.75	\$7.50
Foundry coke, prompt	8.50	8.50	8.50	9.00
Nonferrous Metals:				
(cents per pound to large	huver	(2)		
Copper, electro., Conn		14.375	14.375	12.00
Copper, Lake, Conn		14.375	14.375	12.00
Min Charita Man 37-1-	14.010	17.010	14.010	72.00

Composite Prices

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

52.00

8.25 8.10

15.00

35.00

20.50 14.50

8.25 8.10

15.00

35.00

20.50 14.50 8.25 6.35

35.00

20.50

14.50

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JON

FINISHED STEEL	PIG IRON	SCRAP STEEL					
Oct. 15, 1946	\$28.13 per gross ton \$28.13 per gross ton	\$19.17 per gross ton \$19.17 per gross ton \$19.17 per gross ton \$19.17 per gross ton					
HIGH 1946 2.73011¢ July 4 2.54490¢ Jan. 1945 2.44104¢ Oct. 2 2.38444¢ Jan. 1944. 2.30837¢ Sept. 5 2.21189¢ Oct. 1943 2.29176¢ 2.29176¢ 1942. 2.28249¢ 2.28249¢ 1941. 2.43078¢ 2.43078¢ 1940. 2.30467¢ Jan. 2 2.24107¢ Apr. 1939. 2.35367¢ Jan. 3 2.26689¢ May. 1938. 2.58414¢ Jan. 4 2.27207¢ Oct. 1937. 2.58414¢ Mar. 9 2.32263¢ Jan. 1926. 2,32263¢ Dec. 28 2.05200¢ Mar. 1935. 2.07642¢ Oct. 1 2.06492¢ Jan. 1934. 2.15367¢ Apr. 24 1.95757¢ Jan. 1933. 1.95578¢ Oct. 3 1.75836¢ May. 1932. 1.89196¢ July 5 1.83901¢ Mar. 1931. 1.99626¢ Jan. 13 1.86586¢ Dec. 1930. 2.25488¢ Jan. 7 1.97319¢ Dec. 1929. 2.31773¢ May 28 2.26498¢ Oct. Weighted index based on steel bishapes, plates, wire, ralls, black pipe, and cold-rolled sheets and strip, rer senting 78 pct of the United States opt. Index recapitulated in Aug. 28, 15 issue.	HIGH	HIGH \$19.17 \$19.17 Jan. 2 \$18.92 May 22 19.17 Jan. 11 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 \$19.17 Apr. 10 21.83 Dec. 30 \$16.04 Apr. 9 22.50 Oct. 3 \$14.08 May 16 15.00 Nov. 22 \$11.00 June 7 21.92 Mar. 30 \$12.67 June 9 17.75 Dec. 21 \$12.67 June 9 13.42 Dec. 10 \$10.33 Apr. 29 13.00 Mar. 13 \$9.50 Sept. 25 Aug. 8 6.75 Jan. 3 8.50 Jan. 12 6.43 July 5 11.33 Jan. 6 8.50 Dec. 29 15.00 Feb. 18 \$11.25 Dec. 9					



JONES & LAUGHLIN STEEL CORPORATION

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PITTSBURGH 30, PENNSYLVANIA

THE IRON AGE, October 17, 1946-135

Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 8 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base: primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

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High Straig Tung High Oil h Speci Extra Regu Wa sissip Missi

Field Arma Electric Motor Dyna Trans Trans Trans Trans

F.o throu 10¢ p cludir per 1

Stand No. Angle (F.o.t Light Light

Cut s Screw Tie p Track Track Track *Pli *Plass Chicas plates Ohio, City, Pacifit Young Orego

								0		B81441a	Cuit	Pacific -	DELI	VERED T	
Basing Points	Pitts- burgh	Chicago	Gary		Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohlo	Gulf Ports, Cars	Ports.	Detroit		Phila- lelphia
INGOTS Carbon, rerolling							(\$33.	00 f. o. b.	mill)						
Carbon, forging	\$38	\$38	\$38	\$38	\$38	\$38	\$38								
Alloy	\$48.69	\$48.69				\$48.69		(E	ethlehem	, Massillor	n, Canton,	Coatesville	=\$48.69)	1	
BILLETS, BLOOMS, SLABS Carbon, rerolling	\$39	\$39	\$39	\$39	\$39	\$39	=\$50.20, \$39	\$39				\$51.5014	\$41.50		
Carbon, forging billets	\$47	\$47	\$47	\$47	\$47	\$47	=\$58.20, \$47	Daluth=	\$4914)			\$59.5014	\$49.50		
Alloy	\$58.43	\$58.43				\$58.43		Bethlehe	n, Massil	Ion, Canto	n=\$58.43	3)	\$60.93		
SHEET BARS	\$38	\$38		\$38		\$38	\$38	\$38		(Cantor	=\$38)				
PIPE SKELP	2.05∉	2.05∉					2.05∉	2.05∉		(Coa	tesville=	2.05¢)			
WIRE RODS 15 No. 5 to 9/32 In.	2.30¢	2.30∉		2.30∉	2.30∉		(Wo	rcester=	2.40é)		2.585¢	2.835∉			
SHEETS Hot-rolled	2.425€	2.425€	2.425¢	2.425¢	2.425¢	2,425∉	2.425¢	2.425∉	2.875¢	2.425∉		3.01¢	2.56€	2.685€	2.615¢
Cold-rolled 1	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275∉		3.375∉	3.275∉		3.96¢	3.41¢	3.635¢	3.635€
Galvarrized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.50¢	4.05∉		4.635¢		4.31¢	4.24¢
Enameling (20 gage)	3.80€	3.80€	3.80∉	3.80€			3.80∉		3.90∉	3.80∉		4.485¢	3.935¢	4.20∉	4.16¢
Enameling (10 Gage)	3.20€	3.20∉	3.20€	3.20∉			3.20∉		3.30€	3.20∉		3.885¢	3.335€	3.60∉	3.56∉
Long ternes ²	4.05¢	4.05¢	4.05¢									4.835¢		4.45∉	4.416
STRIP Hot-rolled ³ (6 in, and under over 6 in,	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢		2.45¢ 2.35¢			2.45é 2.35é		3.135¢ 3.035¢	2.585¢ 2.485¢	2.85¢ 2.75¢	2.81¢ 2.71¢
Cold-rolled 4	3.05€	3.15é		3.05€			3.05€	(We	rcester=	3,25é)			3.185é	3.45é	3.416
Cooperage stock	2.55€	2.55¢			2.55é		2.55é	-	1	1				2.95€	
TINPLATE Standard cokes, base box	\$5.00	\$5.00	\$5.00		\$5.10			\$5.10	\$5.10					\$5.375	\$5.301
Electro, box (0,25 lb) (0,50 lb) (0,75 lb)	\$4.35 \$4.50 \$4.65	\$4.35 \$4.50	\$4.35 \$4.50 \$4.65					\$4.35 \$4.60 \$4.75	\$4.60						
BLACKPLATE 29 gage 5	3.30€	3.30€	3.30∉					3.40	3.40					3.67∉	3.59
TERNES, MFG. Special coated, base box	\$4.30	\$4.30	\$4.30					\$4.40	\$4.40						
BARS Carbon steel	2.50€	2.50∉	2.50∉	2.50¢	2.50∉	2.50	2.50		Duluth=2	2,60¢) =3,20¢)	2.885	3.185¢	2.635₺	2.84∉	2.86
Rail steel 6	2.50	2.50∉	2.50€	2.50∉	2.50€	2.50					2.885	3.185∉			
Reinforcing (billet) 7	2.35	2.35∉	2.35∉	2.35∉	2.35∉	2.35	2.35	2.35			2.735	2.785¢	2.485€	2.61€	2.69
Reinforcing (rail) 7	2.35	2.35€	2.35∉	2.35∉	2.35€	2.35	2.35	1			2.735	€ 2.785€	2.485∉		
Cold-finished 8	3.10	3.10€	3.10¢	3.10∉		3.10	É	(D	etroit=3.	15¢)	(Toledo=	=3.25¢)		3.44¢	3.46
Alloy, hot-roiled	2.92	2.926				2.92	2.92	(B	ethlehem,	Massillon	, Canton=	=2,92¢)	3.055€		
Alloy, cold-drawn	3.62	₫ 3.62€	3.62€	3.62∉		3.62	é						3.765€	-	-
PLATE Carbon steel 13	2.50	£ 2.50€	2.50	2.50∉	2.50€		2.50			mont = 2.5		a. Utah=21			2.558
Floor plates	3.75	¢ 3.75∉									4.135	¢ 4.435¢		4.15¢	4.15
Alloy	3.79	€ 3.79€			(Co	atesville	=3.79¢)				4.305	¢ 4.525¢		4.01¢	3.89
SHAPES Structural	2.35	€ 2.35€	2.35	4	2.35	2.35	é	(Bethle	hem=2,3	5¢)	2.735	é 3.035¢		2.54¢	2.4
SPRING STEEL, C-R 0.26 to 0.50 carbon	3.05	ė		3.05			(V	Vorcester	=3.25¢)						
0.51 to 0.75 carbon	4.65	é		4.65			(1	Vorcester	=4.85¢)						
0.76 to 1.00 carbon	6.65	é		6.65			(V	Vorcester	=6.85¢)						
1.01 to 1.25 carbon	9.03	é		9.03	1		(1	Vorcester	=9.23¢)						
WIRE 9 Bright 12	3.05	ié 3.05		3.05	3.05	é	(V	Vorcester:	=3.15¢)	(Duluth	=3.10¢)	3,585		3.44	3.4
Galvanized						Add prop	er size ext	ra and gal	vanizing (extra to Bri	ight Wire	Base			
Spring (high carbon)	4.00	é 4.00	É	4.00	1		(1	Worcester	=4.10¢)	(Tren	ton = 4.25	(é) 4.535	1	4.39	4.33
PILING Steel sheet	2.65	2.65€	é			2.6	5é					3.235	4	2.99	3.0

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromiu	m Nickel		Straight (Chromium	
BASING FOINT	No. 304	No. 302	Ne. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila. Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt. Slabs, P'gh, Chi, Canton, Balt, Phila, Reading. Billets P'gh, Chi, Canton, Watervilet, Syracuse, Balt. Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervilet, Syracuse,	22 99	negotiation 24.67 24.67 negotiation	17.01 17.01	17.47 17.47	negotiation 20.69 20.69 negotiation	25.29 25.29
Ft. Wayne, Titusville. Bars, h-r, Pgh, Chi, Canton, Dunkirk, Watervilet, Syracuse, Bait, Phila, Reading, Ft. Wayne, Titusville	22.99	24.67 25.97	17.01 20.02	17.47 20.56	20.69 24.34	25.29 29.75
Bars, c-I, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, F. Wayne, Watervillet. Plates, P'gh, Middletown, Canton. Shapes, structural, P'gh, Chi. Sheets, P'gh, Chi, Middletown, Canton, Balt. Strip, h, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown. Strip, c-r, P-gh, Cleve, Newark, N. J., Reading, Canton, Youngstown. Wire, c-d, Cieve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila. Wire, fiat, c-r, Cleve, Balt, Reading, Dunkirk, Canton. Rod, h-r, Syracuse. Tubing, seamless, P'gh, Chi, Canton, (4 in, to 8 in.)	27.05 31.38 27.05 38.96 25.43 32.46 27.05 32.46	25.97 29.21 25.97 38.79 23.28 30.30 25.97 30.30 25.97 72.09	20.02 23.28 20.02 28.67 18.39 23.80 20.02 23.80 20.02	20.56 23.80 20.56 31.38 18.93 24.34 20.56 24.34 20.56 68.49	24.34 28.67 24.34 35.16 25.97 34.62 24.34 34.62 24.34	29.75 33.00 29.75 38.49 37.87 56.28 29.75 56.26 29.75

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, O.) An increase of 8.2 pct applies to base

	price	6	17	ıa		84	Cl	Ŧ.	a	3						-
												Б	10	H	36	per lb
High speed																67¢
Straight mol	ybde	nt	ır	n												54¢
Tungsten-mo	lybde	n	u	m												57%
High-carbon-	-chro	m	it	ır	a											43¢
Oil hardenin	g* .															24¢
Special carb	on*															22¢
Extra carbo	n.															18¢
Regular car	bon*															14¢
Warehouse	nei				m		•	n	A						-	Mia.

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

Field grade									per lb
Armature									
Electrical									
Motor									
Dynamo									
Transformer 72									
Transformer 65									
Transformer 58									
Transformer 52									8.925€
F.o.b. Chicag									

through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

56 56 8¢

41¢

394

016

Standard rails, heavier than 60 lb No. 1 O.H., net ton
(F.o.b. basing points) per net ton
ulgnt rails (from billets) \$49.18
Light rails (from rail steel) 49.18
hase ner lh
Cut spikes 3.65¢
Screw Spikes
vic plate, steel 2550
are plates. Pacific Coast 9704
Track bolts, heat treated, to rail-
10aus
Track bolts, jobbers discount 63-5 Plus 12 pct.

"Plus 12 pct.

Basing points, light rails, Pittsburgh, Chicago, Birmingham: cut spikes and tie blates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo, Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)
20x14 in. 20x28 in.
8-lb coating I.C.... \$8.50 \$17.00
15-lb coating I.C.... 9.50 19.00
20-lb coating I.C.... 10.00 20.00

CLAD STEEL

Base prices, cents per pound Stainless-clad
No. 304, 20 pct, f.o.b.
Pittsburgh, Washington,
Pa.
Nickel-clad
10 pct, f.o.b. Coatesville,
Pa.
Inconel-clad
10 pct, f.o.b Coatesville. 26.00
Monel-clad
10 pct, f.o.b Coatesville. 24.96
Aluminized steel
Hot dip, 20 gage, f.o.b.
Pittsburgh Pa.
9.00 Plate Sheet

*Includes annealing and pickling.

WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

Basin Point Name	Basing Basing
bas	e per keg
Standard wire nails\$3.75	
Coated nails 3.75	
Cut nails, carloads 4.85	
base	per 100 lb
Annealed fence wire\$3.50 Annealed galv. fence wire 3.85	\$4.00
bo	se column
Woven wire fence* 72	
Fence posts, carloads 74	91
Single loop bale tiestt 72	
Galvanized barbed wire** 79	
Twisted barbless wire 79	89

*15½ gage and heavier. **On 80-rod spools in carload quantities. †Prices subject to switching or transportation charges. ††Add 50c a ton.

HIGH TENSILE, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalioy	HI Steel	Mayari R	Otis- coloy	Yoloy	Y-50
Producer	Republic	Carnegie- Illinois, Republic	Republic	Alan Wood	Inland	Bethle- hem	Jones & Laughlin	Youngs- town Sheet & Tube	American Rolling Mill
Plates	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	
Sheets Hot-rolled Cold-rolled Galvanized	3.575 4.525	3.575 4.525	3.575 4.525	3.575	3.575 4.525	3.575 4.525 5.50	3.575 4.525	3.575 4.525	5.225*
Strip Hot-rolled Over 6-in 6-in & under Cold-rolled Commodity.	3.60 3.70 4.30	3.60 3.70	3.60 3.70 4.30		3.60 3.70 4.40	3.60 3.70	3.60 3.70 4.30 4.45	3.60 3.70 4.30	5.00*
Shapes		3.45			3.45	3.45	3.45	3.45	
Beams		3.45				3.45			
Bars Hot-rolled Cold rolled	3.70	3.70	3.70			3.70	3.70	3.732†1 4.382†1	
Bar sh pes		3,85			3.85	3.85	3.85	3.85	
Billets, blooms, slabs (per gross ton) Structural Forging			*****				:::::	\$74.65† \$82.23†	

* 21 gage and lighter. heat treating grade.

† Alloy extras apply. ‡ Add 0.379¢ for forging or

WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills

(F.o.b. Pittsburgh only on wrought pipe)

Base price—\$200.00 per net ton

Plack Cale

Can-I	(buttwel	1.3 \
SIPPI	a minimumen	48 8

½-in. ¾-in. 1-in. to 3-in.	60 1/2 63 1/2 65 1/2	48 52 54 1/4
Wrought Iron (buttweld)		
½-in. ½-in. 1-in. and 1½-in. 1½-in. 2-in.	17 % 24 ¼ 28 % 33 32 %	+4 % 2 % 9 1/8 11 % 11 %
Steel (lapweld)	58 61	461/2
2½-in. and 3-in	63	51 1/2
Wrought Iron (lapweld)		
2-in	24 %	4 7/8

2 72-111.												
4-in.											284	
4½-in.	to	8-i1	n.			•					27	101/4
Steel	(bi	ıtt,	e:	rti	ra	1	81	ir	o	ng	g, pla	in ends)
1/2-in.											583	471/2
%-in.												6 51 1/2
1-in. to	0 3.	in.									64	54

Wrought Iron (same as above)

1/2-in.														18 %	+15%
½-in. %-in. 1-in.														25 %	4 3/4
1-in.	to)	2.	-1	1	1.					•		,	33	13

Steel (lap, extra strong, plain ends)

2-in.		 	56	45 1/2
2 1/2 -in.	and 3-in	 	60	49 1/2
3 1/2 -in.	to 6-in	 	63 1/2	53

Wrought Iron (same as above)

8-in		4 4-					28 1/8	85%
2½-in.	10	4-III.					34	16 14
4 1/2 -in.	to	6-in.					32%	145%
0-	2	4 1 -2		 9			 	

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On l.c.l. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or \$2 a ton higher on all buttweld.

BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, min-imum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seami	<i>ess</i>	weld.
	Cold-		
	Drawn R	olled	Rolled
8 in. O.D. 13 B.W.G.	16.52 1	3.90	13.20
2 1/2 in. O.D. 12 B.W.G.	22.21 1	8.70	17.67
8 in. O.D. 12 B.W.G.	24.71 2	0.79	19.56
8 1/2 in. O.D. 11 B.W.G.	31.18	26.25	24.68
4 in. O.D. 10 B.W.G.	38.68	32.56	
(Extras for less c	arload qu	antit	ies)
40,000 lb or ft and o	ver		. Base
\$0,000 lb or ft to 39,9	99 lb or 1	ft	. 5 pct
20,000 lb or ft to 29,9	99 lb or	ft	.10 pct
10,000 lb or ft to 19,9	99 lb or	ft	. 20 pct
5,000 lb or ft to 9,9	99 lb or	ft	. 30 pct
2,000 lb or ft to 4,9	99 lb or	ft	. 45 pct
Under 2.000 lb or ft			

CAST IRON WATER PIPE

						Per no	
6-in.	to	24-in.,	del'd	Chic	ago		70.33
6-in.	to	24-in.,	del'd	New	York		69.60
		24-in.,					
		d larg					
		isco, Lo					
for	a	ll rail	shipn	nent:	rail	and	
wa	ter	shipm	ent le	88			84.40
Cla	1.55	"A" ar	d gas	pipe.	\$5 e	xtra:	4-in.
pipe	is	\$5 a to	n abo	VA 6-	in.	,	
	-						

BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to listings except Large Rivets

Bolts and Nuts

(F.o.b. Pittsburgh, Clevelar ham or Chicago) Cleveland, Birming-

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6	in. & shorter 65 1/2
9/16 & % in. x 6 in.	
% to 1 in. x 6 in. &	shorter61
14 in. and larger, a	
All diameters over	
Lag. all sizes	62
Plow bolts	

Nuts, Cold Punched or Hot Pressed

	(Hexagon	or	80	que	are)				
1/2 in. and	smaller									.62
9/16 to 1	in. inclus	ive.								.59
1 1/8 to 11/	in. inclu	sive								.57
1 % in. a	nd larger									.56
On abo	ove bolts	an	ħ	nı	its,		e	K	ee.	ptir

plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semitin. Hexagon Nuts U.S.S	. S.A.E
Base discount less keg l	ots
7/16 in. and smaller	64
½ in. and smaller 62 ½ in. through 1 in	60
9/16 in. through 1 in 59	58
1 % in. through 1 ½ in 57 1 % in. and larger 56	58
In full keg lots, 10 pct addit	ional dis

count. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

					consumer
Packages,	nuts	loose			71 and 10
In packag					
In bulk .					80
On stov	e bol	ts fre	ight	allowe	ed up to
65¢ per 10	00 lb	based	on	Clevela	and, Chi-
cago, New					
	701 10	0	0.		

Large Rivets (1/2 in. and larger)

								1	B	a	3	e	p	10	7	1	00) 1	b
F.o.b.	Pittsburg	gh.	C	1	e	V	e	l٤	2.1	n	d,			(21	ni	-		
cago	, Birming	ham			0												\$	4.	75
F.o.b.	Lebanon,	Pa.									0			*				4.	90
S	Dinote																		

nall Rivets (7/16 in. and smaller)

																				ff Li	8	ŧ
F.o.b.	Pittsburg	h	,	C	"	e	V	e	la	1	n	d.	9	C	31	1	ic	8	go	,		
Bir	mingham																		65	and	1 5	j

Cap and Set Screws	Percent Off List
(In packages)	
Upset full fin, hexago	n head cap
screws, coarse or fine	thread, up to
and incl. 1 in. x 6 in.	64
Upset set screws, cup an	d oval points 71
Milled studs	
Flat head cap screws, list	ed sizes 30
Fillister head cap, listed	Sizes

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

		CaF								2	31	ho	ri	1	01
70%	or	more	41		~			*					\$3	3	.00
65%		less											3	1	.00
Less	tha	n 60	%										6.5	0	.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per	Gros	s Ton
Old range, bessemer			\$5.45
Old range, non-bessemer .			
Mesaha, bessemer			5.20
Mesaba, non-bessemer			5.05
High phosphorus			5.05
Prices are for ore shippe	d on	and	after
June 24, 1946, and for o			
adjustable pricing agreeme	nts	auth	orized
by Order No. 8, RMPR 11			
These prices do not refl	ect	the	recent
ICC increase in freight ra			

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.
Brass, minus 100 mesh . 1914 to 211/24 Copper, electrolytic, 100 and 375
mesh
mesh
mesh 96 + % Fe
N. Y., carlots, ocean bags7.4¢ to 8¢ Iron, crushed, 200 mesh and finer.
90 + % Fe carload lots 46 Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum
lots
mesh and coarser, 99 + % Fe 254 to 314
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe 174 Iron carbonyl, 300 mesh and finer,
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe90¢ to \$1.75
Aluminum, 100, 200 mesh carlots 954
Antimony, 100 mesh
Lead, 100, 200 & 300 mesh. 13 1/4 ¢ to 16 1/4 to Manganese, minus 325 mesh and
Coarser
coarser
Solder powder, 100 mesh8 1/2¢ plus metal Tin, 100 mesh
Tungsten metal powder, 98%- 99%, any quantity, per lb \$2.60 Molybdenum powder, 99%, in 100-
lb kegs, f.o.b. York, Pa., per lb \$2.65
Under 100 lb \$2.90

North Chick Milh Clev Buff Clev Buff Cinc St. L Pitts St. F Dult India Birm Men New Losn Sant Salt Porti Salt

Sto price:

HO'

COI strip, base.

· Rep

Ohio.

basing bessem Char Tenn., and \$: Lake

COVE

COKE	
Furnace, beehive (f.o.b. oven) Connellsville, Pa Connellsville, Pa., hand drawn.	\$8.75
Foundry, beehive (f.o.b. oven) Fayette Co., W. Va Connellsville, Pa	8.10 8.50
Foundry, Byproduct Chicago, del'd Chicago, f.o.b. New England, del'd Kearny, N. J., f.o.b. Philadelphia, del'd Buffalo, del'd Portsmouth, Ohio, f.o.b. Painesville, Ohio, f.o.b. Erle, del'd Cleveland, del'd Cincinnati, del'd St. Louls, del'd Birmingham, del'd	14.35 16.04 14.40 14.63 14.78 12.88 13.50 14.56 14.56 14.60 15.10
†Except producers situated in	state

other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of \$15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts districts

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carl	oads
Per	
Super-duty brick, St. Louis \$	81.00
First quality Pa. Md. Kv., Mo.,	
Ill., Ohio	20,00
First quality, New Jersey	EQ 00
Sec. quality, Pa., Md., Ky., Mo., Ill.	69.00
Sec. quality, New Jesey	57.00
Sec anality Ohio	3 1 . 50
Ground fire clay, net ton, bulk	9.00
Silica Brick	
Suica Drick	05 00

Pennsylvania and Birmingham Chicago District Silica cement, net ton (Eastern)... Chicago Chrome Brick Standard chemically bonded, Balt.

Plymouth Meeting	. Chester		 . \$54.00
Magnesite Brick Standard, Balt. and Chemically bonded,	Chester		 \$76.00

Grain Magnesite
Domestic, f.o.b. Balt. and Chester in sacks \$44.
in sacks
Domestic, f.o.b. Chewelah, Wash., in bulk in sacks 26.
in sacks
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. York, Pa. 10.
bulk, per net ton, f.o.b. York, Fa. 14

WAREHOUSE PRICES

¢ . 80 le 74

tal ke 60

Ton 75 35

10 50

.10 .35 .04 .40 .63 .75 .50 .50

loads 1000 81.00

\$65.00 74.00 11.50 12.50

et Ton \$54.00

\$44.50 22.00 26.00 10.00 Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP					BARS		ALLOY BARS			
	Hot- Rolled	Cold-	Galvanized	Hot-F	Over 6 in.	Cold-	Plates 1/4 in, and	Structural	Hot-	Cold-		Hot- Rolled, A-8742-50	Cold- Drawn,	Cold- Drawn, A-8742-5
	(10 gage)	Rolled	(24 gage)	Onder	0 111,	Rolled	heavier	Shapes	Rolled	Finished	A-8617-20	Ann.	A-8617-20	Ann.
*Philadelphia New York Boston Baltimore Norfolk	\$3.774 3.856 4.05 3.64 4.037	\$5.139 4.869 5.031 5.118	\$5.2494 5.501 5.725 5.365 5.862	\$4.314 4.375 4.518 4.293 4.577	\$4.214 4.275 4.418 4.193 4.477	\$5.064 5.075 4.985	\$3.875 4.049 4.203 3.865 4.262	\$3.937 4.038 4.023 4.05 4.303	\$4.114 4.134 4.356 4.093 4.377	\$4.564 4.584 4.656 4.543 4.677	\$6.287 6.338 6.503	\$7.387 7.438 7.603	\$7.664 7.684 7.756	\$8.764 8.784 8.856
Chicago Milwaukee Cleveland Buffalo	3.633 3.575 3.575	4.583	5.558 5.347 5.20	4.108 3.95 4.211	4.008 3.85 4.111	4.906 5.0586 4.961	3.958 3.65 3.921	3.958 3.88 3.65	3.908 3.60 3.60	4.20 4.358 4.20 4.20	6.308 6.277 6.05	6.90 7.408 7.377 7.15	7.458 7.20 7.20	8.558 8.30 8.30
Detroit Cincinnati St. Louis	3.71 3.671 3.643	4.76 4.721 4.593	5.526 5.296 5.622	4.085 4.046 4.118	3.985 3.946 4.018	5.002 5.222	3.935 3.952 3.968	3.987 3.983 3.968	3.735 3.902 3.918	4.285 4.502 4.522	6.456 6.441 6.472	7.556 7.541 7.572	7.585 7.602 7.622	8.685 8.702 8.722
Pittsburgh St. Paul Duluth Omaha	3.575 3.817 3.817 4.045	4.625 4.767 4.767 5.72	5.666 5.666 6.00	3.95 4.292 4.292 4.52	3.85 4.192 4.192 4.42	5.000	3.65 4.142 4.142 4.37	3.65 4.142 4.142 4.37	3.60 4.092 4.092 4.32	4.20 4.852 4.945	6.472	7.15 6.322 6.572	7.20 7.952	8.30 8.052
Indianapolis Birmingham Memphis	3.775 3.675 4.221	4.825	5.40 5.20 5.746	4.15 4.05 4.596	4.05 3.95 4.496	5.03	3.92 3.80 4.346	3.92 3.80 4.346	3.87 3.75 4.296	4.47 4.954 4.821	6.17 6.414	7.514	7.32 7.564	8.614
New Orleans Los Angeles San Francisco	4.359* 4.885 4.435	5.40 ¹ 6.635 ¹ 6.035	5.884 6.585 6.585	4.734 5.335 4.885	4.634 5.235 4.785		4.484 4.835 4.535	4.484* 4.735 4.385	4.434* 4.685 4.435	5.175 6.065 5.815				****
Seattle	4.905 ⁵ 4.905 ⁴ 4.81	7.3052	6.435 6.235 6.70	4.635 5.135 5.94	4.535 5.84	****	5.035 ⁵ 5.035 ⁴ 5.29	4.735 ⁵ 4.735 ⁴ 5.29	4.635 ⁵ 4.735 ⁴ 5.19	6.265 6.015 6.48	7.735 ⁸ 7.735	8.7358 8.885	****	9.585

BASE QUANTITIES

Standard unless otherwise keyed on

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb

ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over: (7) 3500 lb and over: (8) 1000 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

* Add 29.1¢ for sizes not rolled in Birmingham.

** City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

PIG IRON PRICES

Per gross ton, retroactive to May 29.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malle- able	Besse- mer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Maile- able	Besse- mer	Low Phos
ethichem irdsboro irdsboro irmingham utfalo hicago leeveland elevolat betroit buiuth crie verett ramile City familiton leville Island rovo harpsville parrows Point leellon dedo ofedo ofeno	28.00 28.00 26.00 28.00 29.00 29.00	29.50 29.50 24.88* 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50 28.50	30.00 30.00 29.00 28.50 28.50 28.50 29.00 30.00 28.50 28.50 28.50 28.50 28.50 28.50	30.50 30.50 29.50 29.50 29.00 29.00 29.50 30.50 29.00 29.00	34.00	Boston Boston Brooklyn Brooklyn Canton Canton Cincinnat! Cincinnat! Cincinnat! Cincinnat! Los Angeles Los Angeles Mansfield Philadelphia Philadelphia Philadelphia San Francisco San Francisco Seattle Seattle St. Louis St. Louis	Everett. Birdsboro-Steelton, Bethlehem. Birdsboro Clev, Ygstn, Sharpsvil, Buffalo Birmingham. Hamilton. Buffalo. Birdsboro Provo Buffalo. Cleveland-Toledo. Buffalo. Swedeland Birdsboro Provo Buffalo Provo Buffalo Granite City Buffalo.	3.55 4.30 1.24 4.89 1.70 2.16 5.25 16.33 2.16 3.74	29.50 31.78 29.54 27.80* 30.70 31.25 30.16 29.93 31.25 31.25 28.50	30.00 32.28 30.04 29.18* 31.20 31.75 30.66 30.43 31.75 31.75 29.00	30.50 32.78 30.04 29.74 31.70 30.66 30.93	31.00 33.28 30.54 32.20 31.16 31.43 	38.41 37.26 37.55 38.86 36.16 50.33 37.77 35.38 50.33

Republic Steel Corp. has been granted a \$2 increase on basic and foundry pig iron produced at Birmingham.

(1) Struthers Iron & Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, \$33.00 and \$34.00, respectively. Newberry Brand of Lake Superior charcoal iron \$39.00 per g.t., f.o.b. furnace. Delivered to Chicago, \$42.34.

High phosphorus iron sells at Lyles, Tenn., at \$28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pet silicon content in excess of base grade which is 1.75 to 2.25 pet); phosphorus differentials, a reduction of 38¢ per ton for phosphorous content of 0.70 pet and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$34.00; f.o.b. Buffalo—\$35.25. Add \$1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for prices of comparable analysis.

W a

Detro ... capab equip peller devel of Co Gra name jet m pulsio are s and v lic fo The ing t ordin beach thems landin Hy stream veloc hydra The s in a r from The ing in rudde plishe of the to m asterr C. tinent W. N Marin subsid dro-p men a cruise As inboa 200 h able p possil is sai As of Pr the n propuless f ing th tinen this e both water fire b

	-FERROALLOT PRICES-	•
Ferromanganese	Farrachrama	Osker Ferradiless
78-82% Mn, maximum contract base	Ferrochrome (65-72% Cr, 2% max. 8i)	Other Ferroalloys Ferrotungsten, standard, lump of
price, gross ton, lump size, f.o.b. Balti-	Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b.	1/4 X down, packed, f.o.b. plant
more, Philadelphia, New York, Birming- ham, Rockdale, Rockwood, Tenn.	shipping point, freight allowed. Eastern Central Western	Niagara Falls, Washington, Pa., York, Pa., per pound contained
Carload lots (bulk)	0.06% C 23.00 23.40 24.00	T, 5 ton lots, freight allowed 1188
F.o.b. Pittsburgh 139.50	0.06% C 23.00 23.40 24.00 0.10% C 22.50 22.90 23.50 0.15% C 22.00 22.40 23.00	Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allow-
\$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.	0.20% C 21.50 21.90 22.50	openhearth \$2.70
Briquets—cents per pound of briquet.	0.50% C 21.00 21.40 22.00 1.00% C 20.50 20.90 21.50	Crucible \$2.80
freight allowed, 66% contained Mn. Eastern Central Western	2.00% C 19.50 19.50 20.50	High speed steel (Primos) \$2.90 Vanadium pentoxide, 88-92%
Carload, bulk 6.05 6.30 6.60 Ton lots 6.65 7.55 8.55	66-71% Cr, 4-10% C 14.50 14.90 15.00 62-66% Cr,	V2O8 technical grade, contract
Less ton lots 6.80 7.80 8.80	62-66% Cr. 5-7% C 15.05 15.45 15.55	Ferrocolumbium, 50-60%, contract
Spiegeleisen	Briquets - contract price, cents per	basis, f.o.b. plant, freight allowed, per pound contained Cb.
Contract prices, gross ton, lump, f.o.b.	pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.	lowed, per pound contained Cb. Ton lots
Palmerton, Pa.	Eastern Central Western	Less ton lots
16-19% Mn 19-21% Mn 3% max. Si 3% max. Si	Ton lots 9.80 10.30 11.80	Langeloth, Washington, Pa., per pound contained Mo 95¢
Carloads \$35.00 \$36.00 Less ton 47.50 48.50	Less ton lots10.10 10.60 12.10 High-Nitrogen Ferrochrome	Calcium molybdate, 40-45%, f.o.b.
F.o.b. Pittsburgh, Chicago 40.00	Low-carbon type: 67-72% Cr. 0.75%	Langeloth, Washington, Pa., per pound contained Mo 80¢
Managanasa Matal	N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for	Molybdenum oxide briquets, 48- 52% Mo, f.o.b. Langeloth, Pa.,
Manganese Metal Contract basis lump size cents per	ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66.71% Cr. 4-5% C. 0.75% N. Add	per pound contained Mo 80¢
Contract basis, lump size, cents per pound of metal, f.o.b. shipping point,	5¢ per lb to regular high-carbon ferro-	Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa.,
freight allowed, eastern zone. 96% min. Mn, 0.2% max. C, 1% max.	chrome price schedule.	per pound contained Mo 80¢ Ferrotitanium, 40-45%, 0.10%C
Si, 2% max. Fe. Carload, bulk	S. M. Ferrochrome Contract price, cents per pound chro-	max., f.o.b. Niagara Falls, N. Y.,
L.c.l. lots 32	mium contained, lump size, f.o.b. ship- ping point, freight allowed.	ton lots, per pound contained Ti \$1.23 Less ton lots \$1.25
Electrolytic Manganese	High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	Ferrotitanium, 20-25%, 0.10%C
F.o.b. Knoxville, Tenn., freight allowed	Si, 4-6% Mn, 4-6% C. Eastern Central Western	max., ton lots, per pound contained Ti \$1.35
east of Mississippi, cents per pound.	Carload 15.60 16.00 16.10	Less ton lots
Carloads	Ton lots 16.65 17.30 18.50 Less ton lots 17.30 17.95 19.15	High-carbon ferrotitanium, 15- 20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight al-
Less ton lots 36	Low carbon type: 62-66% Cr, 4-6% Si,	lowed, carloads
Low-Carbon Ferromanganese	4-6% Mn, 1.25% max. C. Eastern Central Western	Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston,
Contract price, cents per pound Mn con-	Carload 20.00 20.40 21.00 Ton lots 21.00 21.65 22.85	Ala., carlots, with \$3 unitage
tained, lump size, f.o.b. shipping point, freight allowed, eastern zone.	Less ton lots 22.00 22.65 23.85	freight equalled with Rockdale, Tenn., per gross ton \$58.50
Carloads Ton Less	Chromium Metal Contract prices, cents per lb, chromium	Ferrophosphorus, Electrolytic, 23-
0.10% max. C, 0.06% P, 90% Mn 21.00 21.40 21.65	contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr. 1% max. Fe.	26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight
0.10% max. C 20.50 20.90 21.15 0.15% max. C 20.00 20.40 20.65	Eastern Central Western	agualizad with Nachvilla ner
0.30% max. C 19.50 19.90 20.15	0.20% max. C 83.50 85.00 86.25 0.50% max. C 79.50 81.00 82.25	gross ton \$75.00 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
0.50% max. C 19.00 19.40 19.65 0.75% max. C,	9.00% min. C 79.50 81.00 82.25	no.b. plant, freight allowed, per pound of alloy.
7.00% max. Si 16.00 16.40 16.65	Chromium—Copper Contract price, cents per pound of alloy,	Carload lots
Silicomanganese	f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr. 88-90% Cu,	lump, f.o.b. plant, freight al-
Contract basis, lump size, cents per	of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.	Carload, bulk 4.60¢
pound of metal, f.o.b. shipping point, freight allowed. 65-70% Mn, 17-20% Si,	Shot or ingot 45¢	Alsifer, 20% Al, 40% Si, 40% Fe,
1.5% max. C.	Contract price per lb of alloy, lump,	contract basis, f.o.b. Niagara Falls, carload 5.75¢
Carload, bulk	f.o.b. shipping point, freight allowed.	Ton lots 7.356
Briquet, contract basis, carlots, bulk	30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.	Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo,
freight allowed, per ib of briquet. 5.80 Ton lots	Eastern Central Western Carloads 13.00 13.50 15.55	Ohio, freight allowed, per pound Car lots
Less ton lots 6.55	Ton lots 14.59 15.25 17.40	Ton lots
Silver Inc. (classic france)	Less ton lots 15.50 16.25 18.40 Calcium—Manganese—Silicon	Less ton lots 9.75¢
Silvery Iron (electric furnace) Si 14.01 to 14.50%, \$51.25 f.o.b. Keokuk,	Contract prices, cents per lb of alloy,	Boron Agents
Iowa: \$48.00 f.o.b. Jackson, Ohio: \$49.25	lump, f.o.b. shipping point, freight allowed.	Contract prices per pound of alloy,
f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and	16-20% Ca, 14-18% Mn, 53-59% Si. Eastern Central Western	Contract prices per pound of alloy. f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max.
including 18%. Add \$1.00 per ton for low impurities, not to exceed: P-0.05%, S-	Carloads 15.50 16.00 18.05	SI 0 50% may AI 0 50% max. C.
0.04%, C-1.00%.	Ton lots 16.50 17.35 19.10 Less ton lots 17.00 17.85 19.60	Eastern Central Western Less ton lots. \$1.30 \$1.3075 \$1.329
Cilian Matel	Calcium Metal	Manganese—Boron 75.00% Mn, 15-20% B.
Silicon Metal Contract price, cents per pound con-	Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point,	5% max. Fe, 1.50% max. Si, 3.00% max.
tained Si, lump size, f.o.b. shipping point,	freight allowed. Add 1¢ for central zone;	C. Ton lots \$1.89 \$1.903 \$1.935
freight allowed, for ton lots, packed. Eastern Central Western	5¢ for western zone. Cast Turnings Distilled	Less ton lots 2.01 2.023 2.055
96% Si, 2% Fe. 13.10 13.55 16.50	Ton lots \$1.35 \$1.75 \$4.25 Less ton lots . 1.60 2.00 5.00	Nickel-Boron 15-18% B, 1.00% max. Al,
97% Si, 1% Fe 13.45 13.90 16.80	CMSZ	1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni. Less ton lots. \$2.10 \$2.1125 \$2.1445
Ferrosilicon Briquets	Contract price, cents per pound of alloy,	Less ton lots. \$2.10 \$2.1125 \$2.1445 Silcaz No. 3, contract basis, f.o.b.
Contract price, cents per pound of	f.o.b. shipping point, freight allowed. Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	plant, freight allowed, per pound
Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.	Si, 1.25-1.75% Zr, 3.00-4.5% C. Eastern Central Western	of alloy. carload lots
Carload, bulk . 3.60 3.75 3.90	Ton lots 12.00 12.75 14.75	Ton lots
Ton lots 4.05 4.55 4.60	Less ton lots 12.50 13.25 15.25 Alloy 5: 50-56% Cr. 4-6% Mn. 13.50-	plant, freight allowed, per pound
Less ton lots 4.45 4.80 4.85	Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	of alloy.
Electric Ferrosilicon	Ton lots 11.75 12.50 14.50	Ton lots
Contract price, cents per pound contained Si, lump size in carloads, f.o.b.	Less ton lots 12.25 13.00 15.00 SMZ	Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
anipping point, freight allowed.	Contract price, cents per pound of alloy,	No. 1 87.00
Eastern Central Western	f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.	No. 6
75% Si 8.55 8.70 9.25	Eastern Central Western	Bortram, f.o.b. Niagara Falls
80-90% Si 9.50 9.65 10.15 90-95% Si11.80 11.95 12.40	Ton lots 12.00 12.85 14.60 Less ton lots 12.50 13.35 15.10	Less ton lots, per pound 50

Water-Jet-Propelled Boats Will Be Offered To Public This Spring

Detroit

• • • Water - jet - propelled boats capable of operating where craft equipped with conventional propellers cannot venture are being developed by the Gray Marine Div. of Continental Motors Corp.

Gray Marine officials who have named the new high velocity water jet method of propulsion "hydropulsion" emphasize that the boats are still in the experimental stage and will not be offered to the public for several months.

These boats are capable of passing through weed beds and shallow water which would foul an ordinary propeller; they can be beached and backed off by flooding themselves under the hull like landing boats.

Hydropulsion utilizes a solid stream of water ejected at high velocity by a specially designed hydraulic propulsion pump unit. The stream of water exerts force in a manner similar to gas ejected from a jet airplane engine.

These boats are capable of turning in their own length and are rudderless; steering is accomplished by changing the position of the jet. The boat can be made to move sidewise and operate astern.

C. J. Reese, president of Continental Motors Corp. and John W. Mulford, president of Gray Marine Motor Co., a Continental subsidiary, showed the unique hydro-propelled boats to newspapermen at Continental's annual press cruise.

As the world's largest builder of inboard marine engines from 5 to 200 hp, Continental is in a favorable position to develop the unique possibilities of "hydropulsion," it is said.

As early as 1937 Keenan Hanley, of Prospect, Ohio, originator of the new application of hydraulic propulsion, introduced a propeller-less fire boat which was used during the Cincinnati flood. The Continental engine which powered this experimental vessel was used both to propel the boat and pump water for fire fighting. A 21-ft fire boat of this same general de-

sign has been delivered to the city of Wheeling, W. Va.

During the war Hanley's company supplied 103 water jet propelled fire boats of steel construction and 30½-ft length to the U.S. Coast Guard.

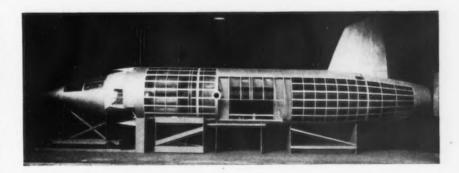
Pgh. Mills Indicate Common Labor as The Chief Hiring Problem

Pittsburgh

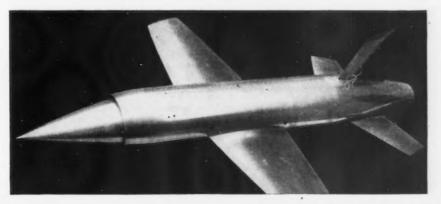
• • • A survey of steel mills in this area indicates that the jobs mills are having difficulty in filling are mainly general labor; jobs that are hot or where there are unpleasant fumes such as in pickling houses; and those jobs that are common to the housing industry. The straight general labor classification is difficult to fill, according to one observer, mainly because of the CIO-USWA requiring new labor to start at the bottom rate with promotions and job sequences coming from that base. Consequently, companies cannot compete with other less basic or nonmetalworking industries in obtaining this type help.

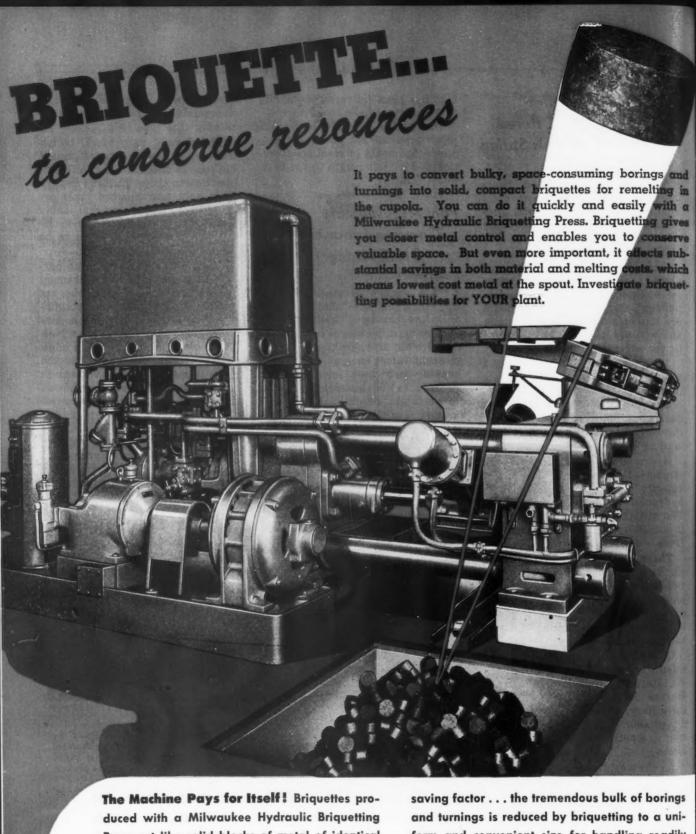
Bricklayers, carpenters, boiler-makers, engineers, metallurgists, hot jobs in sheet and bar mills and openhearth shops, pickling department help, and common labor are the spots where general labor shortages occur, but common labor and metallurgists seem to be extremely acute spots.

The end of the war saw no particular increase in the retirement of older men from skilled jobs, but many companies now are examining critically their pension systems. A recent survey by a New York bank indicated that an additional 1 million have been covered by retirement or pension plans in recent years. The survey showed that of those covered by retirement plans, the lower paid employees are receiving 46 to 63 pct of the annual average working pay, while those in higher paid brackets are getting between 40 and 47 pct of their average annual pay when employed.



PAGE BUCK ROGERS! Two views of a piloted supersonic aircraft "designed" by Miles Aircraft Ltd., at the request of the British Air Ministry. It is calculated that the ship would be able to fly at a speed of 1000 mph at a height of 36,000 ft, which it should reach in 1½ min. The Air Ministry has abandoned the project. which is shown here in model and mock-up only.





Press act like solid blocks of metal of identical size and weight. They melt readily, with practically no loss whatsoever. Aside from serving as a conservation measure, the briquetting process pays for itself in the greater amount of scrap metal salvaged from borings and turnings in the plant. Also of importance is the space and labor form and convenient size for handling readily and without breakage.

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Check Your Tonnage! Why not check your annual tonnage of metal borings and turnings to determine the possibility of salvaging it economically. Milwaukee engineers will gladly make available to you, for the asking, a vast store of knowledge and experience in solving your chip reclamation problems. Write today for Bulletin 117 giving complete details.

Foundry Equipment Co.

3238 W. PIERCE STREET,

MILWAUKEE 4, WISCONSIN, U.S.A.

WAA Considering Bids For S. Chicago Plant Now Run by Republic

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• • • Five bids are being considered by the War Assets Administration on the second largest steel plant built by the Government during the war, at South Chicago, Ill., and operated by the Republic Steel Corp. It is said that the final decision as to disposal of the plant will not be made before Oct. 31, and WAA is presently considering the following offers:

Kaiser-Frazer bid—The offer was in the nature of a lease based on the output for 5 yr with option to renew. Minimum first year rental, \$875,000; second year \$1,000,000 and the third year \$1,100,000. The auto company also submitted an offer to buy at "fair value" which would be determined between Kaiser-Frazer and WAA. Kaiser plans to make semi-finished steel to be shipped to steel mills capable of converting to products that could be used directly in the manufacture of automobiles.

Republic Steel Corp. bid—Republic's offer was the same lease proposition as the one it submitted last April which was turned down by WAA. This lease calls for a \$200,000 minimum annual rental based on production, with option for renewal after 5 yr. It is Republic's contention that the government would collect approximately \$3 million annually assuming a fair production rate. The purchase offer was \$30 million to be paid at the rate of \$1½ million yearly for 20 yr.

Phillip D. Fitzgerald bid—Fitzgerald offered to buy the plant for \$28,350,000 with the first payment of \$4 million to be made immediately. Fitzgerald mentioned that he had \$12 million capital at present and that the balance due on the plant would be paid off in four yearly payments of \$6,087,500 each.

Central Steel Tube Co., Clinton, Iowa, bid—C. A. DePue made an offer in April of this year in the name of his firm to buy the plant at \$17½ million. He also made another offer in his own name to buy the plant at \$19,230,000.

John W. Tukovich bid—This Veteran of World War II, located



ONE ALWAYS STANDS OUT!

In the field of metal cleaners, Wyandotte Porenac is an unequaled performer.

Prepared especially for the removal of drawing lubricants prior to pickling in porcelain enamel plants,
Wyandotte Porenac emulsifies the toughest mineral oil compound with speed, economy and certainty.

The superior action of this balanced formulation eliminates the necessity for pre-cleaning, and thus greatly reduces over-ali cleaning time. Its concentration requirements are low—its life in solution remarkably long.

Important, too, are the free rinsing qualities of Wyandotte Porenac, which prevent contamination of solutions in subsequent operations.

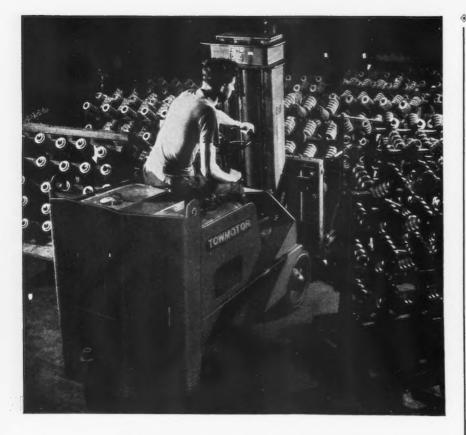
Wyandotte Porenac is of such versatility that it probably can be adapted to your specific problem, whether it be cleaning prior to porcelain enameling, barrel-plating, oxide finishing or other heavy-duty cleaning operations.

Your Wyandotte Representative will gladly tell you more about this and other Wyandotte Metal Cleaners. A call will bring him.



SERVICE REPRESENTATIVES IN 88 CITIES

WYANDOTTE CHEMICALS CORPORATION . J. B. Ford Division . Wyandotte, Michigan



Geared-To Capacity Production

MILLIONS OF GEARS—gears of many sizes and shapes, for a large variety of uses—are produced by Warner Gear Division, Borg-Warner Corporation. Mass production of this sort entails numerous handling problems, many of which are effectively solved by a fleet of eleven Towmotors.

On receiving docks, a single Towmotor handles all types of raw materials including 18-foot bar stock, keeps materials flowing to production departments. In the shop, Towmotors tier 5600-lb. loads three high to triple storage space, provide a simple answer to the perplexing problem of transporting 1200-lb. cyanide pots from heat-treating to storage. One unit often does the work of a ten-man gang.

In the shipping department, two Towmotors load 250,000

lbs. of gears daily, in addition to supplying loads for three interplant trucks. And to Towmotor's record for versatility and capacity can be added economical operation... operating costs for each unit total only \(^{1}\)4 of the operator's wage.

For every handling problem, however unusual, there is an engineered solution . . . a solution based on Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, 1230 East 152nd Street, Cleveland 10, Ohio.

TOWMOTOR

in Detroit, offered to buy at \$20,-223,894 and proposed to finance the purchase of the plant by RFC loan, private company loan or by stock issue.

Youngstown Sheet & Tube Co., which was reported interested in the plant, did not submit a bid.

While the plant is a completely integrated operation, it was designed chiefly to produce high quality alloy in large bar sizes and shapes, which are not in heavy demand in ordinary peacetime use. C. P. Cutler, district manager, Republic Steel Co., has said that any company would have to spend around \$10 million to round out the facilities of the plant for normal peacetime use. The principal equipment needed is a new finishing mill and more heating furnaces.

Situated on the east bank of the Calumet River, the South Chicago works spreads over 160 acres and the plant contains 68 buildings with a total floor area of approximately 3,100,000 sq ft. Equipment for steel making includes four open hearth furnaces of 200 ton capacity; nine electric furnaces of 70 ton capacity, only six of which can be used in their present condition; one 44-in. blooming mill of 960,000 net ton capacity; and one bar mill of 480,000 net ton capacity. Pig iron production has a rated capacity of 450,000 net tons with 405,000 net ton production

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If Kaiser acquires the plant, approximately \$30 million of additional equipment would have to be installed to produce the grades and sizes of products necessary for Kaiser-Frazer Corp. automobile production.

The plant was originally built by the government at a cost of \$92 million and assumed the status of a white elephant even before the war ended. The electric furnace melting capacity has never been fully utilized and due to labor shortages the rolling mills, for the most part, have been operating at only one turn per day. At present, the plant employs about 1300 workers and Republic officials estimate that if they are awarded the mill, the number of employees will be doubled.



its physical properties are entirely satisfactory. In every application where machinability counts, increased production and lowered costs have been the result.

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"H" Steels are alloy steels produced to your "product prescription." This means that "H" Steels have a much narrower hardenability band guaranteed. Wisconsin has been a leader in the development of these steels and at present is the largest producer of "H" Alloy Steels.

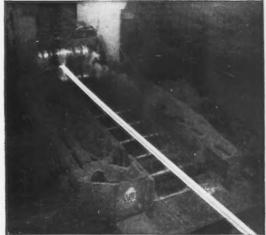
Wisconsin's completely integrated operations from ore and coal mines to the finished steel, staffed by top-flight steelmakers, are your assurance of excellence in alloy and special steels. Our sales and metallurgical staffs are at your service.

WISCONSIN STEEL COMPANY

(Affiliate of International Harvester Company) Chicago 1, Illinois 180 North Michigan Avenue

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are specified by engineers wherever 100% dependability is demanded



USWA Asks Secrecy For Records of Membership

Philadelphia

• • • The CIO-USWA asked the Third Circuit Court of Appeals to set aside a subpoena for union data on its activities at Weirton, W. Va., since secrecy of early membership lists and of expenses is essential in an organizing campaign. The union's counsel stated that the union must conceal from the employer its activities until the organization is underway. Counsel for Weirton Steel Corp., and its affiliate, National Steel Corp., requested the court to reject the motion.

The suit is the result of a contempt of court action brought by the National Labor Relations Board against National, Weirton, and seven of its officials, as well as five officers of the Weirton independent union. The NLRB charged failure to comply with an order, approved by the circuit court, banning unfair labor practices. Weirton, on July 5, 1941, indicated it would comply with the order except that it would not reinstate 6 of the 17 discharged employees and pay back wages for time they were idle.

The CIO-USWA motion that the court set aside the subpoena was reserved by the court. NLRB counsel indicated that under the Wagner Act the NLRB has established the principle employees are guaranteed freedom from inquiry in labor organization matters, thus supporting the CIO-USWA's

WAA Asks Bids on Sale Of Coking Coal Mines

• • • Bids have been asked by WAA for the purchase or lease of three surplus coking coal mines with an estimated annual capacity of 865,000 tons. Located in Mc-Alester, Okla., these mines were operated during the war by the Sheffield Steel Co. of Texas and the Lone Star Steel Co. The reported cost to the government was \$6,021,758.

Sale of a war-surplus magnesium castings plant in Fayetteville, N. Y., to the Precision Castings Co., wartime lessee for \$175,000 was announced. WAA said that the company plans to continue present production.



2 BILLION CU. FT. OF AIR Without Wear

SUN COMPRESSOR LUBRICANT...

Keeps Big, Industrial, Diesel-Driven Compressors in Perfect Running Condition for Four Years

A well-known manufacturer operates a battery of big 400-H.P. Diesel-driven, 2-stage compressors, each one producing $1,850\,\mathrm{cu}$. ft. of air per minute under $100\,\mathrm{lb}$. pressure.

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Sun oil, specially refined to meet this type of operation, was used for four years of almost continuous 24-hour-a-day operation.

During 20,000 hours of actual running, producing more than two billion cubic feet of air, there were no lubrication problems whatsoever. A routine inspection showed no apparent wear, and no replacement of parts was necessary.

For the vital equipment on your production line, in your power plant, or in your machine shop, pick the "Job-Proved" Sun lubricants that will insure low-cost, trouble-free production. Call the nearest Sun office today for information on Sun's full line of quality lubricants.

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Wilson States Output Of Autos Should Meet Demand in 2-Yr Time

Washington

• • • Assuming that materials are available and that there are no major or serious work stoppages, the automotive industry may reasonably be expected to produce 5,000,000 passenger cars and trucks during 1947, C. E. Wilson, president of General Motors, told members of the National Press Club on Oct. 3.

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Production should begin to catch up to demand in about 2 yr with customers able to get cars at "fair prices on short delivery," he said, adding that this of course, hinges on the premise that neither runaway inflation nor a buyers' strike develops.

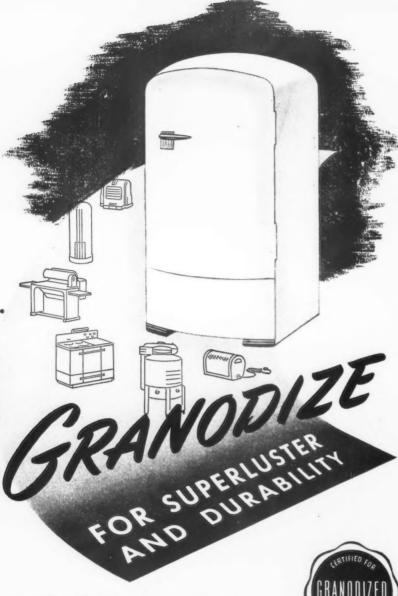
Shortages of raw materials and parts still constitute serious bottlenecks, he said, pointing out that his company had shipped pig iron from Boston and even from Mexico, though it increased metal cost by 50 pct, in order to maintain a working inventory which recently got down to a $1\frac{1}{2}$ day supply. Nuts and bolts are shipped by air from Buffalo and other points.

Also, a great deal of attention is given to turning out parts to keep aging vehicles running until new car demand can be met, he declared. He pointed out that while new car output is still below the prewar rate, production of service and replacement parts is twice the prewar levels.

Mr. Wilson denied rumors that excessive quantities of cars are being exported. Car exports are controlled by the government, he pointed out, and is frozen at about 5 or 6 pct of production as in prewar years.

In response to a question posed by Paul Wooten, press club president, Mr. Wilson expressed as a personal opinion that it would be some time, possibly 10 yr or more, before car prices dropped back to prewar levels.

"We are used to thinking of the dollar as a sort of fixed thing," he declared. "We are currently finding out that it is not. I don't expect to see a return to the purchasing power of the prewar dollar for a decade or so. It might be a good thing for the country if we can hold the situation where it is now and not have any more inflation of wages and prices."



Cold SPRAY-GRANODINE, makes possible that beautiful, lustrous, pure white finish so much desired on modern refrigerators, kitchen cabinets and a host of other white finish metal products.

Cold SPRAY-GRANODINE, the pioneer low temperature phosphate coating process (with peroxide), produces a uniform, dense, hard zinc phosphate coating that assures higher luster and paint durability needed to preserve a beautiful finish even under severe exposure conditions.

Cold SPRAY-GRANODINE, is ideally suited to processing (in continuous production in power spray washers) either large or small products, rapidly, efficiently and economically. The present trend toward Granodizing attests to its efficiency and time-proved effectiveness.

AMERICAN AMBLER



PAINT CO. PENNA.

Information Free

(1) Carbon Steel Castings:

Procedure in meeting customer's requirements for steel castings, presented in this folder, discusses pattern checking, pouring test castings, checking layout, foundry control of production and inspection. Belle City Malleable Iron Co.

(2) Tachometers:

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Line of tachometer recorders and in-dicators are described in bulletin No. S1400. Includes wiring diagrams, applica-tion data and accessory information, with illustrations of instruments, magnetos and typical installations. Bristol Co.

(3) Steam Cleaner:
Specification circular describes Model
JO Hypressure Jenny instantaneous steam
cleaner. Details of the streamlined postwar model, featuring complete accessibility and unit control panel are shown.
Unit is suitable for cleaning of machinery,
parts, automobile engines, walls, windows, etc., or in sterilizing and disinfecting. Homestead Valve Mfg. Vo.

(4) Clamping Tools:

Toggle action clamps, pliers and wrenches which are preset for pressures demanded by the work at hand, are described in bulletin. Diagrams of each type of tool and prices are given. Rnu-Vise, Inc.

(5) Drill Extractor:

Use of magnetic drill extractor for removing broken or detached bits and drill rods from drill holes is explained in illustrated folder. Made of Ainico permanent magnetic steel, the compact, pocketsize extractor can lift up to 40 times its own weight. Dings Magnetic Separator Co.

(6) Metal Cutting Tools:

Catalog 16 is a complete buyers' guide covering high speed and carbon steel twist drills, reamers, milling cutters, counterbores, end mills, hobs and special tools. One section of its 281 p. is devoted to engineering data. National Twist Drill & Tool Co.

(7) Diesel Lubrication:

Technical bulletin No. B-1 (revised) gives the complete story of diesel engine development, construction, operation and maintenance. Representative types of diesels and important accessories are described and illustrated, together with discussion on fuel-injection systems, cylinder and bearing lubrication, and lubricating oil recommendations. Sun Oil Co.

(8) Safety Brakes:
Builetin 460 contains information on industrial safety brakes ranging from 12 to 20 in. in diam. Special features are elimination of self-energizing action and use of almost entire drum area for braking. Diagrammatic sketches and specifications are included. Linderman Devices, Inc.

(9) Water Softeners:

Basic types of ion-exchanging water softeners for industrial use are explained in pamphlet. Softeners are both pressure and gravity types which feature automatic equipment to control backwashing, brining and rinsing processes. Permutit Co.

(10) Flexible Couplings:

Simplicity of design of Torflex flexible couplings, which consist of two metal caps, threaded to fit each other, two rubber bushings and a metal spacer, is stressed in leaflet. Assembly of couplings is shown. No special tools are needed; no costly shaft preparation required. Harris Products Co.

(11) Zircon Refractories:

Bulletin 201 covers zircon refractories for high temperature service and special applications. It is said to be the first complete outline written on Zircon refractories and their application to various industries. Chas. Taylor Sons Co.

(12) Salt Tablets:

Enteric coated Pep-Up salt tablets are recommended, in folder, as guard against heat fatigue and heat prostration. Can be taken in desired amounts with no fear of salt sickness or nausea. U. S. Safety Service Co.

(13) Laboratory Equipment:

Metallurgical laboratory apparatus for rapid and accurate analyses of metals in industrial laboratories is listed and priced in illustrated bulletin 76 A. Carbon and sulphur determinators, photelometers, combustion furnaces, temperature indicators, gas analyzers are a few of the instruments described. Specimen grinding and polishing devices are included. Central Scientific Co.

(14) Ductility Testing Machine:
Catalog page describes and gives specifications of the new model PA Superior ductility testing machine. Model PA-2 has a 15,000 lb capacity for stock up to 1/2 in thick. Another model has 30,000 lb capacity for stock up to 1/2 in thick. Steel City Testing Laboratory.

(15) Portable Pyrometer:

A complete line of portable pyrometers is described in bulletin D602-4. Specifications for proper selection of extension holders, adapters and thermocouple tips are listed in chart form. Wheelco Instruments Co.

(16) Speed Reducers:

Design features and sectional views of spiral-bevel speed reducers are presented in bulletin 200, with tables giving load characteristics, service factors and horse-power ratings. Dimensions and line drawings of the horizontal and vertical types are included. Philadelphia Gear Works, Inc.

(17) Filters:

Production of filters for gases and liquids is described in booklet. General fields of application, aid and oil filtration in aircraft and railway practice, filtration for internal combustion engines, purification of compressed air for engineering and industrial purposes are among the phases discussed. Drico Industrial Corp.

(18) Micrometers:

Folder discusses methods of manufacturing company's line of micrometers, including outside models in sizes from 0 to 6 in., inside and depth micrometers, and sets in both English reading and metric types. Illustrates various inspection procedures and describes GS dial test indicators and other toolmakers' and machinists' specialties, George Scherr Co.

(19) Warehouse Prices:

Price book, effective June 1, covers warehouse stocks of Misco rolled heat and corrosion resistant alloys at Detroit. Sheets, plates, rounds, hexagons, flats, squares, pipes, nuts and welding rod are listed. Standard trade customs are outlined and extras are quoted. Rolled Products Div., Michigan Steel Casting Co.

(20) Metal Etchers:

E-Z mark etchers which reproduce in 1 to 3 sec on metal, any mark or line appearing on a stencil film, are featured in folder. The etcher can be used on round or flat surfaces. A tool room unit which etches names, numbers and other identification on iron and steel is also described. Ideal Industries, Inc.

NOTICE TO READERS: Your request for this information will be forwarded promptly to the manufacturer issuing the literature. The offer is good for only two months.

10/17/46 THE IRON AGE, New York 17, N. Y. 2 Send the free booklets circled below: 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 NAME..... TITLE.... MEASE STATE BUSINESS..... COMPANY STY...... STATE..... ZONE..... STATE.....

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INFORMATION FREE (Continued)

(21) Hydraulic Equipment:

Bulletin 460 contains detailed information, including basic specifications, covering complete line of hydraulic high pressure pumps, valves, controls, boosters and packaged power units, with, sectional views and line drawings of various types. Hydro-Power, Inc.

(22) Threading Machine:

Pertinent information on the No. 16 precision threading machine designed for the threading of duplicate parts, is given in bulletin No. TM-2. Machine has threading range up to 1 in. diam in National coarse thread series, and up to 1½ in. in fine pitch threads. Geometric Tool Co.

(23) Grapples:

Bulletin No. 802 gives suggestions for handling such materials as pulp wood, rock, scrap iron and heavy trash and contains information on modern grapple devices for many diversified special services. Bulletin is fully illustrated. Hayword Co.

(24) Carbon-Graphite:

Characteristics, general information on operating conditions, methods of assembly, and chemical resistance of Graphitar (carbon-graphite), a nonmetallic engineering material which is mechanically strong, as hard as steel and lighter than magnesium, are presented in bulletin. Twenty-four typical applications, including bearings, molds, wear plates, etc., are described and illustrated. U. S. Graphite Co.

(25) Flexible Couplings:

Folder describes flexible couplings in which misalinement and free end float are taken care of by a slight bending of diskrings. Design is said to eliminate backlash, as well as wear and lubrication. Single bearing motor drives, generator drives, shaft type and high-speed marine types are illustrated. Thomas Flexible Coupling Co.

(26) Fire Extinguishing:

Use of carbon dioxide in engineered fire extinguishing systems is discussed in pamphlet. How one hazard or many may be protected by a single system which provides immediate extinguishment with no damage from the carbon dioxide and with uniform performance, is shown. Cardox Corp.

(27) Precision Casting:

Advantages of precision casting, the lost wax and a plaster molding process, in handling of materials difficult to machine or forge are told in bulletin 19B6451. Every type of metal can be cast except magnesium alloys and tolerances can be held from ±0.003 to 0.008 in. per inch. Typical plaster castings are shown. Allis-Chalmers Mig. Co.

(28) Grinding Wheels:

Handbook discusses abrasives and chief characteristics of Norton wheels, explaining constant and variable factors to consider when selecting grinding wheel specifications. How to recognize types of wheels by markings is explained. Other technical publications available are also listed. Norton Co.

(29) Resinous Cement:

Physical properties of all-purpose resinous cement which combines features of adhesion and durability with corroston resistance, is discussed in folder. Tells where and how the cement can be used. Nukem Products Corp.

(30) Broaching Machines:

Twenty-four-page bulletin describes type XP vertical pull-down broaching machines and illustrates 21 tool, fixture and machine installations for internal and external broaching operations. Specifications cover machines from 5 to 27½-ton pulling capacity with 24 to 66-in. stroke. Otigear Co.

(31) Cutters:

Catalog 55 lists in detail standard in-serted blade cutters and illustrates many special types. Specifications and descrip-tion of various types of face mills, arbors or shanks, end mills, side mills etc., aid in selecting the right cutter for the job. Ingersoil Milling Machine Co.

(32) Cleaning Equipment:

Illustrated bulletin No. 6E1 describes standard models of spray, jet, acrewdrum and continuous type metal cleaning and drying equipment, and features a table showing how seven basic type units can handle 12 operating conditions. Optimus Equipment Co.

(33) Metal Treating:

Booklet entitled "Ammonia in Metal Treating" explains in detail use of ammonia in nitriding, dry cyaniding, bright annealing, copper brazing, powder metalurgy and arc welding. Installations of these processes in metalworking plants are described and illustrated. Chemical and physical properties of ammonia are discussed. Mathieson Alkali Works Inc.

(34) Process Control:

Bulletin No. 17 briefly describes and illustrates instruments and controls for the process industries, including control components, measuring components and instrument combinations. Application data including sizes, pressure standards and ranges are listed and typical control systems of both single and multiple element type are illustrated. Bailey Meter Co.

(35) Pneumatic Tools:

Data in 40-p catalog No. 46, describes complete line of pneumatic tools, including high-speed turbine grinders, heavy duty production grinders, short grinders, and rotary files and wire wheel brush tools. Also shown are drills of ¼ to ¼ in. capacity, screw drivers, nut setters for up to ¼-in. machine screws, and a range of accessories. Are Equipment Corp.

(36) Induction Motor:

Construction, features and typical applications of the type OG (protected type) standard squirrel cage induction motor for general purpose requirements, are covered in illustrated bulletin No. 720. Louis Allis Co.

(37) Material Handling:

General catalog describes and illustrates line of wire rope clips, blocks and sheaves, winches, car pullers, 2500 to 40,000-lb single line capacity hoists, derricks, material elevators, 25 to 40-ton locomotive cranes, ditchers, pile drivers and marine deck machinery. American Hoist & Derrick Co.

(38) Leather Packings:

Usage, sizes, tables, drawings and engineering data on cup, Vee, flange and U type leather packings are presented in booklet. Methods to assist in proper design, application and maintenance of packings are explained. Alexander Brothers.

(39) Electric Hoists:

Bulletin No. A-407 gives material and construction details of self-contained electric hoists, in small and medium sizes which meet any hoisting or hauling requirement for which normal rope pull does not exceed 18,000 lb at 500 fpm. Safety devices on these drum hoists, scraper hoists, low pedestal and room hoists are stressed. Vulcan Iron Works.

(40) Metalworking Machinery:

Booklet presents pictorially and with brief descriptive matter, various metal-working machinery, such as cold heading machines, threaders, slotters, etc., power presses up to 600-ton capacity and other pressroom equipment. Mill machinery and accessory equipment are other products shown. Waterbury Farrel Foundry & Machine Co.

(41) Electric Palletier:

Description and specifications of the new electric Palletier fork truck of 1000-and 2000-lb capacities, are given in folder. Crescent Truck Co.

(42) Conveyor Equipment:

Trolley wheels, trolleys, wheel and bracket assemblies, together with industrial casters, pneumatic wheels and leveling jacks are listed and illustrated in catalog No. 141. Dimensions and capacities are among the specifications given. Saginaw Products Corp.

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Powerful "Jeep" handles heavy load of coiled strip with ease.

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"Jeep" tiers loads up to 2000 lbs. with quick precision.



"Jeep" loads live skid, a part of the Mercury "Trackless Train".



Displaying maneuverability that makes the "Jeep" a favorite with industry.



COMPACT, POWERFUL—EASILY MANEUVERED

Rugged—yet so compact that it travels narrow aisles, maneuvers in and out of box cars and through doors with magic ease—that's the Mercury "Jeep" fork truck! Stacks to ceiling height—hydraulically activated hoist and tilt spot loads up to 2000 lbs. with quick accuracy. Lightweight permits use where floor capacity is limited.

Additional features of the "Jeep" include: Mechanical Contactor Travel Control—All Welded Frame—Single Unit Drive. For details, request Bulletin 201-6. Or, ask a Mercury Sales Engineer to call.

THE MERCURY MANUFACTURING CO.

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TRACTORS — TRAILERS — LIFT TRUCKS







CODOL Liquid Grinding Compound has often proved to be the primary factor in turning an unacceptable performance into a complete success. One user says: "When Codol replaced another

fluid for grinding a crankshaft, wheel life jumped from 14 to 20 pieces and gumming disappeared." Says another: "Of seven compounds tested, Codol produced the best finish." And another: "Since standardizing on Codol for surface grinding, wheel and segment life has improved and rusting has been eliminated."

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Stuart Oil Engineering Goes With Every Barrel

Pennsylvania Civilian Labor Now 41/4 Million

Pittsburgh

• • • The Pennsylvania civilian labor force is now the greatest in history, totaling 4,250,000 as against a total of 3,800,000 at the end of the war, according to the U. S. Employment Service. There is no overall labor shortage nor is any such shortage anticipated in terms of expected production programs. Stringencies might occur in given skilled occupations and in specific geographical sections of the state. The immobility of labor, occasioned chiefly by the housing shortages, is the prominent factor in any tight labor spots.

The character and composition of the labor force and supply has altered in the past year. Nearly 1 million veterans have returned to jobs or are seeking work and normal new entrants and economic growth have added 100,000. Against this, some 650,000 persons, mainly women, have withdrawn from the labor market. This total movement of 1,750,000 persons represents a turnover of more than 40 pct, and has encompassed withdrawal of skilled workers and the addition of inexperienced workers; the withdrawal of older workers and the addition of young workers; and the withdrawal of women and the addition of men.

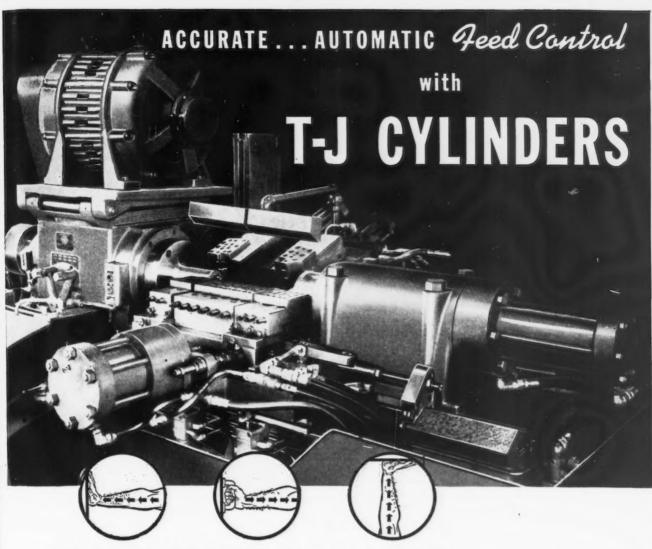
The important factor in future developments is production ability of labor. Labor demands will be determined by production quotas on the one hand and worker output on the other.

River Boat Crews Of Armco Reject CIO-NMU

Huntington, W. Va.

• • • Crew members of the river boats of the American Rolling Mill Co., overwhelmingly rejected, by a ratio of 10 to 1, the National Maritime Union (CIO) as their bargaining agent in a National Labor Relations Board election.

Labor Board officials announced that out of the 37 eligible voters, 30 voted against CIO representation while 3 voted in favor of accepting the union as their bargaining agent. The election was requested by the union, which had previously claimed that a majority of the men and women aboard Armco vessels were members of the union.



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men ssels T-J Cylinders on this Sparks Hydra-Feed Lathe furnish automatic and accurate control for feeding the work to cutters in this multiple tooling set-up.

Another tough job-and T-J Cylinders do it right!

More and more today in industries throughout the nation ... T-J Air and Hydraulic Cylinders are used to simplify operations and save time and labor. For pushing ... pulling ... lifting ... clamping ... 100 lbs. or 50,000 lbs. Available in many standard sizes and styles ... both cushioned and noncushioned types. Backed by 29 years' experience ... T-J engineered to do the job better and cut costs! Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Mich.





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Now Available!

Coming off the new production lines in Chicago, the SHELDON-built SHELDON-Vernon Precision Machine Tools* are now available at the same moderate prices that made them first in the moderate priced field. Built in the new modern SHELDON plant which is equipped with every advanced machine tool building facility, they are better than ever—even more accurate, more rugged and better finished.

Lighter and smaller and less costly than machine tools of

equal accuracy, they provide a faster, more convenient and economical means of doing all but the heaviest operations.

Write for Bulletin on:

*SHELDON-Vernon Horizontal Milling Machine

*SHELDON-Vernon Vertical Milling Machine and Jig Borer

*SHELDON-Vernon 12" Shaper

Builders of Good Lathes Since 1919

SHELDON MACHINE CO., INC. 4210 N. Knox Ave., Chicago 41, U.S.A.

See the new Sheldon Machine Tools at Space No. A183, National Metal Congress, Atlantic City, Nov. 18-10-22

Permanent Exposition Of Foreign Equipment To Be Held in Moscow

New York

• • Under sponsorship of the Chambers of Commerce of the Soviet Union, arrangements are under way for the establishment in Moscow of a permanent international exhibit of foreign industrial equipment and machinery. It is hoped that this exhibit will be ready some time early in 1947 and will consist of displays representing various phases of productive endeavor including machine tools, industrial machinery, construction machinery, transportation, both rail and automotive, and agricultural equipment.

Plans for this exposition include the building of a special auditorium for the showing of motion pictures and other educational devices and a library and reading room equipped with technical books, journals, reports and other reference material.

Several companies in the United States have already prepared their exhibits, but shipment to the USSR is being held up by the various maritime strikes. These displays, prepared by Timken Roller Bearing Co., Thomas A. Edison Industries and Coppus Engineering Co., may be sent out in October.

To conform to exposition regulations, displays must be demonstrable. In those cases, however, where equipment is too heavy or too complex to be set up at the exposition, scale models, layouts, diagrams and flow charts may be substituted to illustrate how the equipment works.

Participating companies retain ownership of the equipment but must agree to exhibit for a minimum of 1 yr. At the end of that time, the company may elect, to change or withdraw its display.

The initial idea for holding a permanent industrial exhibit originated in the requests of a number of American firms that came to the Amtorg Trading Corp., here, for help in introducing American equipment to Soviet industry.



IN SIZES AND SHAPES WITHIN THE ABOVE RANGE FOR YOUR PARTICULAR FABRICATING NEEDS!

More than 25 years in the business has acquainted us thoroughly with the needs of manufacturers of parts made from welded steel tubing. Not only is Michigan tubing

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here, erican available in the most frequently specified size range but its structure and manufacture is closely guarded for satisfactory and economical reforming and machining into parts.

PARTS PREFABRICATED

Michigan is completely equipped to fabricate your parts for you. Michigan welded steel tubing

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Engineering advice and technical help in the selection of tubing best suited to your needs.

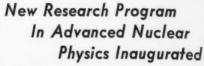
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Oak Ridge, Tenn.

program in advanced nuclear physics started here Sept. 15, when a selected group of 35 scientists and engineers began a year of study and research at the Clinton Laboratories. Col. E. E. Kirkpatrick, deputy district engineer, said that the first group to take the course had been selected on the basis of the specific needs of the Manhattan project for qualified men in various fields of research and development in connection with the atomic energy program.

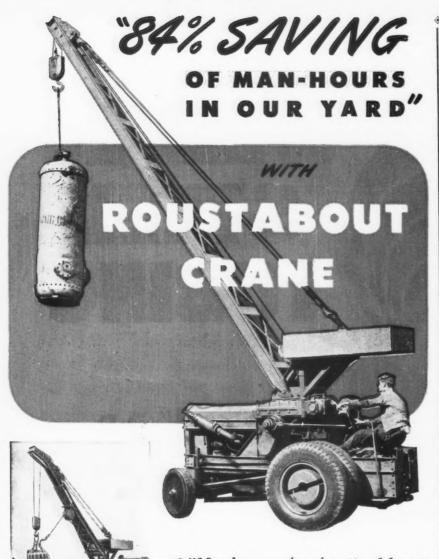
with the atomic energy program. Dr. Frederick Seitz, who is on part time leave from his post as head of the physics dept. of Carnegie Institute of Technology, Pittsburgh, will direct the training course. The program was first suggested and outlined by Dr. Eugene P. Wigner, director of research, Clinton Laboratories, on leave from Princeton University where he is professor of physics. Dr. Wigner and Dr. Seitz worked together in the wartime atomic research at the metallurgical laboratory at the University of Chicago.

In addition to a formal series of lectures, the study program at the laboratories will include opportunities for work in two broad fields. First, it will involve fundamental research in nuclear physics and radio-chemistry, and second, will include design of atomic piles and will have as one of its objectives the extension of pile technology into peacetime applications.

The group will be employed by Monsanto Chemical Co., contract operators of the laboratories, and will work with the full time staff which has been engaged in the field of nucleonics for a number of years. Others closely associated with the program are: Dr. James H. Lum, executive director, Dr. Lothar W. Nordheim, director of the physics div., Dr. James R. Coe, Jr., director of the chemistry div., Dr. Miles C. Leverett, director of the technical div., and Dr. C. Rogers McCullough, director of the power pile div.

The men who will attend the school include Dr. John H. Buck, of the Socony-Vacuum laboratories, Paulsboro, N. J.; Dr. Edward C. Campbell of the Palmer physical

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With magnet, Roustabout handles large or small castings.



• With grab-bucket Roustabout hustles sand, cinders, etc.

• "Man-hours reduced to 1/7 of former needs." "75% reduction in man-hours." "Saves about 60% on man-hours." "60 to 80% saving in time and man-hours." These are common reports from Roust-about users who mechanize their yards with this mobile load-hustler that goes where you want it when you want it, keeps things moving, prevents costly delays. Modernly built for years of overwork, loads to 7½ tons. Write now for facts about this profitable Roustabout hundreds of plants wouldn't be without!

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Buy a Forging Press for IMPRESSION DIE FORGING

IMPRESSION die forgings are produced faster and more economically on Ajax High Speed Solid Frame Forging Presses than on other types of presses. Ajax Forging Presses are built to operate at correct speeds to permit hot metal to flow without excessive abrasion to the die impressions. Coupled with this, their extreme rigidity minimizes the period of contact of the hot metal with the dies, cuts down on heat transfer and further reduces die deterioration.

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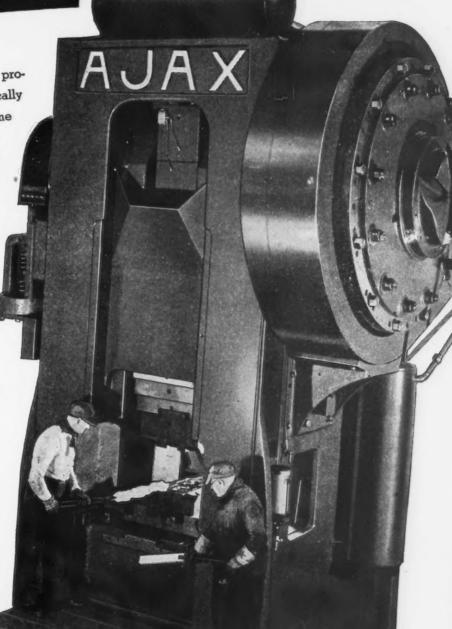
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Makeshift trials on slower, less rigid and less accurate presses are not dependable...it takes a Forging Press for impression die forging.

Write for Bulletin No. 75



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This dual-ability is at your service, for a 10 CFM or a 50,000 CFM (or higher) installation. You can rely upon our recommendations and the performance of our equipment, because there's almost a century of successful air-handling experience behind them. Call on us, without obligation.

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laboratory, Princeton University; Dr. Herbert M. Clark of Rensselaer Polytechnic Institute; Dr. Karl Cohen, Esso Laboratories, Elizabeth, N. J.; Leonard Eisenbud, McLaughlin Carr Associates, New York; Lloyd Hunter, Westinghouse Electric Corp., East Pittsburgh, Pa.; Dr. S. Lawroski, Esso Laboratories, Elizabeth, N. J.; Stephen M. MacNeille, Tennessee Eastman Corp., Oak Ridge; Dr. Jordan J. Markham, Brown University; R. C. Mason, Westinghouse Electric Corp., East Pittsburgh; John R. Menke, Kellex Corp., New York; Professor Roy F. Newton, Purdue University chemistry dept.; Dr. Henry C. Ott, Rensselaer Polytechnic Institute; Dr. Sidney Siegel, Westinghouse Electric Corp.; Dr. W. I. Thompson, Standard Oil Development Co., New York; F. C. Vonder Lage of Washington, D. C., and R. M. Boarts, head of the University of Tennessee chemical engineering dept.

Other scientists who will participate in the training program engaged in the development of the power pile are on leave of absence from the Allis-Chalmers Co., Frederic Flader, Inc., General Electric Co., Monsanto Chemical Co., National Advisory Committee for Aeronautics, Northrup Aircraft, Inc., Purdue University, TVA, Westinghouse Electric Co., and Wright Aeronautical Corp.

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Industrial Building Cost in Third Period Shows 5-Point Gain

Cleveland

• • Basic industrial building costs reached 152 during the third quarter, according to the Austin Co. index, which compared with an all-time peak of 153 in the first quarter of 1920.

George A. Bryant, president, Austin Co., attributed the 5-point increase reported during the summer months largely to wage increases in the construction trades and supplying industries. He expressed the hope that further price increases which will be necessary to cover the long-overdue adjustment of freight rates would be offset to some extent by improving labor efficiency.

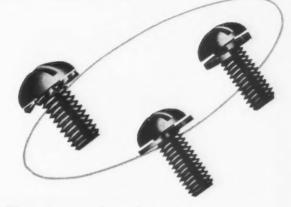
"The government's curbs on nonemergency public works, commercial and many industrial projects, should help increase efvasher and screw...



nly one unit to handle

MS reduce your costs in many ways... only one to order, to stock, to handle, to drive.

duction flows smoother, faster, for there's no bling with loose parts, no hunting lost washers, no ting for the screw driver operator to catch up.



Yes, SEMS save you money at every phase of operation. Write for samples today.

emble your product with SEMS, test it thoroughly and you'll see how SEMS not only save you money—
yimprove quality as well!

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the *MODERN* fastener unit

SEMS are Pre-Assembled Washer and Screw Units in which the Washer is held on the Screw by the Rolled Thread and is free to rotate.

SEMS ARE AVAILABLE FROM THE FOLLOWING MANUFACTURERS

Central Screw Co. Chicago, III.

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Reliance Division
Massillon, Ohio

The Lamson & Sessions Co. Cleveland, Ohio

Russell, Burdsall & Ward Bolt & Nut Co. Port Chester, N. Y.

Stronghold Screw Products Inc. Chicago, III. National Lock Co. Rockford, III.

The National Screw & Mfg. Co. Cleveland, Ohio

Scovill Manufacturing Co.
Waterville Division
Waterville, Conn.

New England Screw Co. Keene, N. H. Pheoli Manufacturing Co. Chicago, III.

Shakeproof Inc.

Division of Illinois Tool Works
Chicago, Ill.

Steel Co. of Canada, Ltd. Hamilton, Ont., Canada

> American Screw Co. Providence, R. I.



Faster drying of metal parts on racks is accomplished with the use of the new OPTIMUS Continuous Type Drying Machine. Ideal for handling loaded racks continuously after plating, or after any water solution dip. Drying time runs 4 to 6 minutes.

This new OPTIMUS Dryer is used largely as a cold air and hot air dryer. Cold air system includes a blower and a series of nozzles.

SEND FOR

Your copy of new bulletin
"Cleaning Metal Parts before
and after finishing"



DEPENDABLE OPTIMUS DETERGENTS

for every metal cleaning equipment operation.

Hot air system includes an air heater, recirculating blower, a damper to adjust the mixture of atmospheric and re-circulating air, and necessary nozzles.

It can be used as a single stage dryer, or it can handle a number of successive operations, alkaline, acid, or neutral. Enclosed design of machine permits efficient ventilation through exhaust blower connection when desired. Can be heated by steam, gas or electricity.

An OPTIMUS Plan for the mechanized handling of your metal parts through washing, rinsing and drying, can help you save labor, reduce rejects and increase your production.

OPTIMUS EQUIPMENT COMPANY

ENGINEERS AND MANUFACTURERS

137 CHURCH STREET, MATAWAN, N. J.

STANDARD AND SPECIAL TYPES OF EQUIPMENT FROM THE SMALLEST TO THE LARGEST SIZES FOR A WIDE VARIETY OF OPERATIONS.

OPTIMUS



FOR WASHING . RINSING . PICKLING AND DRYING OF METAL PARTS

ficiency in the completion of jobs now under way, and on any new projects which may be authorized," Mr. Bryant said.

Restrictions are tending to concentrate the available supply of skilled craftsmen and the materials required for industrial plants on a smaller number of jobs, he added.

"It is to be hoped that the producers of building materials and equipment will be able to step up their deliveries to the remaining jobs so that construction schedules can be speeded up. Until they do, there is little prospect of reducing the prolonged organization expense which results from the inability to get prompt delivery on so many different items."

Lake Erie-Pittsburgh Canal Idea Revived

Pittsburgh

• • • National interest in the long proposed Lake Erie to Ohio River canal was expressed recently when Col. W. E. Lorence, chief of the Army Engineers at Pittsburgh, speaking before the Propeller Club, said that his staff is now reviewing an Army engineering survey made in 1939. That survey approved the practicality of the river-to-lake canal from an engineering and economy basis.

Colonel Lorence pointed out specifically that the interest was in building a through canal from the lakes to the river rather than a stub end canal from the Ohio River to Youngstown. This phase has been the main bone of contention between Youngstown and Pittsburgh industrialists for many years.

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At some time during the history of the long fight for the canal, it was proposed to build the canal in two parts, completing the Ohio River to Youngstown section first and then the section from Youngstown to the Lakes at a future date Pittsburgh industrialists opposed this idea strenuously since it would leave Youngstown in a position of having all water coal rates and Pittsburgh without any particular benefit.

Colonel Lorence stated that "We are dealing with a through canal, one that will make it possible to tie up 6000 ton freighters anywhere along the Ohio-Monon

SQUARE-Duct 9

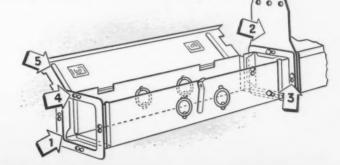


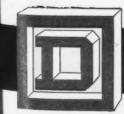
Power where you want it-when you want itwithout buying or moving long runs of conduit.

That's why so many plants use SQUARE-Duct to carry feeders, branch circuits, and other groups of conductors. SQUARE-Duct saves time and money every time a machine is moved or a new one added. Knockouts every three inches along the duct provide complete flexibility of machine location. Circuits are easily accessible for inspection or maintenance.

The initial cost of SQUARE-Duct is comparable to that of conduit wiring. Installation cost is substantially lower. For complete details . . . call your Square D Field Engineer, or write Square D Company, 6060 Rivard Street, Detroit 11, Michigan, for Bulletin 6000.

- Drawn collar affords secure support for the duct and automatically aligns each length to prevent twisting. It also serves as a stable connection to the adjacent length equipped with a similar collar.
- 2 Notice how hanger fits securely between two lengths of SQUARE-Duct. Hangers usually can be placed at end of every five-foot length to prevent sagging and twisting of duct.
- Hanger is bolted to both sides, top and bottom, affording even distribution of weight and offsetting any tendency to twist.
- A Double keyhole screw slots help in making alignment adjustments.
- 5 Emboss on cover, both sides and bottom, protects wires from scraping on sharp edges when being pulled 0 through duct.





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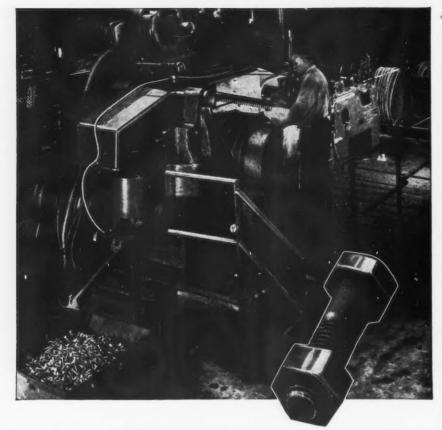
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Ordinarily the cost of installing and assembling an industrial fastener in a machine or fabricated structure is many times the cost of the fastener itself. Therefore, you want the best fasteners you can get. The greater dimensional accuracy, cleaner threads, well-formed heads and bodies of Oliver products are reflected in faster assembly and appreciable cost savings for you. When you specify OLIVER, you are sure of getting the best!

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gahela River channel from Montgomery Dam to Clairton, Pa. Thus, the entire Ohio Valley would be thrown open to boat freight movements, lower steel production costs and improving Pittsburgh's competitive position.

A canal 18 ft deep that would accommodate vessels with a 14-ft draft is favored by Colonel Lorence. A bill backing an appropriation for the project will likely be presented to the next Congress.

Claims Reduction In Materials Handling Machine Stock Nos.

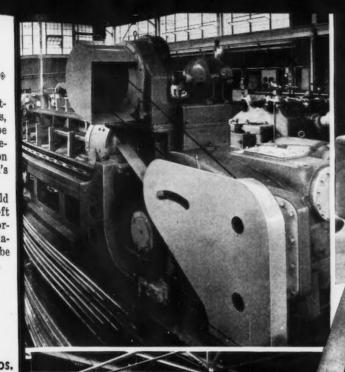
Washington

• • • A reduction of 68 pct in the volume of stock numbers for machines of many manufacturers of materials handling equipment is claimed by the Office of the Quartermaster General to have resulted from an 8-month survey to standardize parts. Materials handling equipment includes fork lift trucks, warehouse trailers and tractors and cranes suitable for use in warehouses. The equipment is also used widely in the discharge or loading of ships, freight cars and other mediums of transport.

The reduction in the volume of stock numbers for spare parts, it was stated, means a 33 pct saving in warehousing space for stocks of these parts and a 40 pct saving in time required for their selection and packing.

Most of the manufacturers of materials handling equipment, before the war, were comparatively small concerns. Due to the necessity for immediate procurement of large numbers of this equipment, the announcement said, it became necessary to deal with 30 different manufacturers. This resulted in the acquisition of approximately 160 different models, all of which required a complete inventory of spare parts for maintenance.

Few manufacturers of materials handling equipment make their own engines, transmissions, axles, steering gears, etc. These are purchased from automotive manufacturers and assembled in accordance with the various designs of the numerous manufacturers



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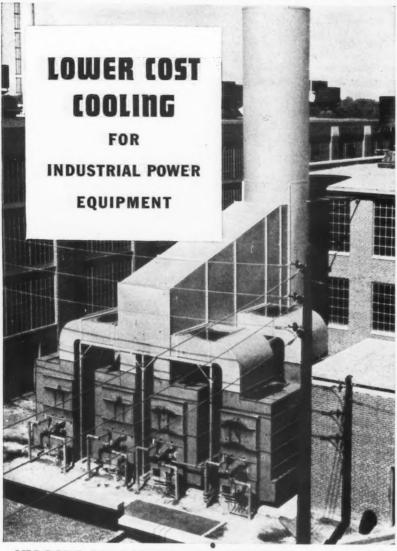


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Ample cooling capacity is available in compact, economical equipment. There are additional savings in the cost of piping and pumping.

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turers of materials handling equipment. As a result, many of the parts of one vehicle are identical with those of vehicles made by other manufacturers, each of which catalogued the similar parts with their own stock number.

This resulted in a large duplication in the Quartermaster Corps inventory of parts, many of which were identical, but listed under the different stock numbers assigned to them by the various manufacturers.

The survey, which covered plants in many parts of the country, revealed thousands of identical parts listed under different stock numbers. One extreme example is illustrated in a certain bearing which had been stocked by the Quartermaster Corps under as many as 28 different manufacturers numbers, but which is now stocked under only one Quartermaster number.

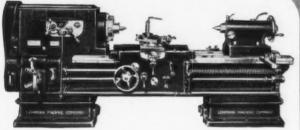
The new cataloguing and standardization of spare parts was declared to have greatly facilitated supply control, procurement, and the storage and distribution of parts for materials handling equipment. It has also resulted in fewer vehicles being out of service for lack of parts at vital times, and reduced the inventories of spare parts in the various Quartermaster Corps shops and depots by providing a more efficient parts service.

Because of the success of the project on materials handling equipment parts, the Office of The Quartermaster General has begun a similar standardization project for assemblies and component parts of Quartermaster Corps special purpose vehicles.

In spite of the greater efficiency obtained through the cataloguing of spare parts for materials handling equipment, a study is being made for the purpose of determining the feasibility of developing a minimum of basic models, with parts highly interchangeable, for use in all Army installations both in the United States and overseas.

In creating the final designs of this equipment, the Office of The Quartermaster General has enlisted the aid of an advisory board composed of representatives of the materials handling equipment and allied manufacturers representing all phases of the industry.





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Medium								*		24"	up	to	12 1/8" Hole
Large			•					0		27"	up	to	13 1/8" Hole
Large						*				30"	up	to	14 1/8" Hole
Large										36"	up	to	161/2" Hole

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NAM Explains Aim Of Campaign to Reform U.S. Patent System

New York

• • • An interesting booklet entitled "Patents and the Manufacturer" is being distributed by the National Assn. of Manufacturers explaining its position and the aims of its campaign to modify the patent system. The pamphlet includes this "Patent Quiz" which clarifies the views of the associa-

(1) What is a patent?

A patent is an official document issued by the government granting an inventor the exclusive right to his own invention for 17 yr. It merely gives him the right to exclude others from making, using, or selling his invention.

(2) On what may a patent be granted?

A patent is granted to anyone who has discovered or invented "a new and useful art, machine, manufacture, or composition of matter, or a new and useful improvement thereof." The Patent Office takes great pains to make sure that an applicant for a patent is the first to invent or discover that for which he solicits a patent, not merely the first to apply for a patent on the invention or discovery. This is a distinctive feature of the American patent system.

(3) Can a patent be extended?

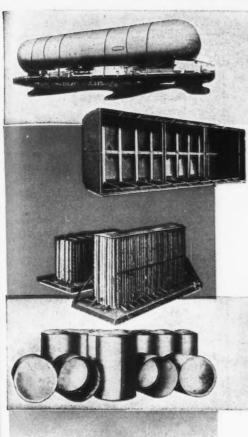
No, except by special act of Congress which has not happened in more than a dozen cases in the last 50 yr. At the end of 17 yr after the patent has been granted the invention passes into the public domain and the patentee can no longer control the manufacture, use, or sale of the invention.

(4) Is a patent a monopoly?

A patent is a monopoly, though for a limited time, in the same manner that the ownership of any property, for example an automobile, is a monopoly. It can be used as one sees fit, although, of course, it may not be used to violate any

(5) What is a patent license?

A patent license is an agreement by which the owner of a patent



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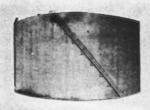
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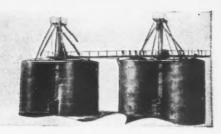
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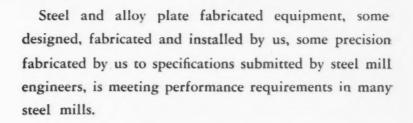


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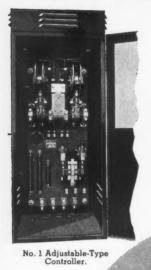
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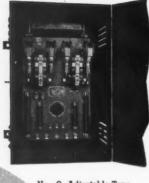


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EC&M Controllers are widely used wherever Lifting Magnets are required.



permits others to make, use, or sell his patented invention.

(6) Do patent licenses restrain trade?

No. A patent license expands trade. In granting a license the holder of a patent gives up some of his exclusive rights. In issuing licenses a patent holder has the right to (a) fix a royalty; (b) prescribe a sales price for the licensed invention, but not the resale price; (c) limit the quantity of articles which the licensee may manufacture, use, or sell; (d) limit the territory in which the licensee may operate under the patent; (e) prescribe the purpose or the field of use for which the licensee can utilize the invention. These are conditions under which he agrees to give up to his licensee certain of his exclusive rights to his invention and at the same time protect his own interests.

(7) What is cross-licensing?

Cross-licensing is the exchange of patent rights between two or more patent holders. Situations often arise in which two companies or two individuals hold patents affecting the manufacture of the same product. An invention might utilize something covered by an unexpired patent or maybe an improvement thereon, and as a result neither patent holder is able to manufacture the best possible product without conflicting with the other's patent. It is obviously in the public interest that the two parties should interchange rights in the form of a cross-licensing agreement.

(8) Does a patent prevent the government from using an invention in case of war or other emergency?

No. The government has the right of eminent domain, the right to take patents like any other property for public use. The owner, however, must be compensated as is the case in any seizure of property by the government.

(9) Is the exchange of patents between American and foreign companies legal?

During time of war it is illegal for any American to carry on business with an enemy country. However, in time of peace the flow of scientific and technical knowledge recognizes no territorial bounda-

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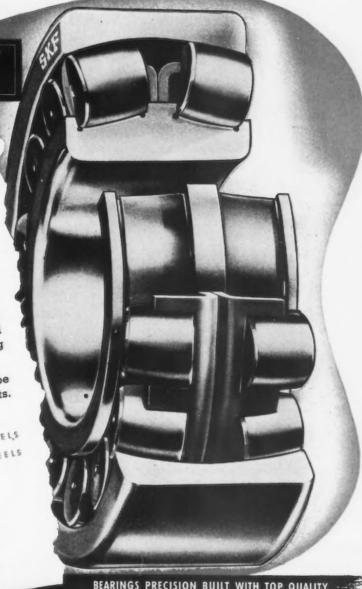
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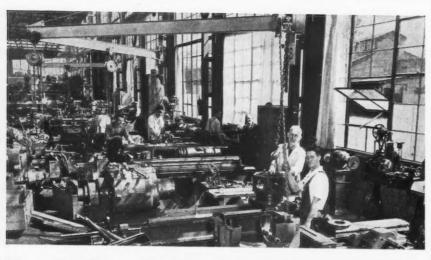
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ries. Information on new inventions and discoveries is exchanged through publications, conventions of scientists, and exchange of patents. The availability of copies of patents is one of the most important contributions to the exchange of technical information. In these ways scientific and industrial progress are promoted.

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(10) What is a cartel?

A cartel is a combination of competitors for the purpose of allocating or controlling production or for maintaining or fixing prices, and thereby restraining trade. Such combinations when they unreasonably restrain trade are illegal in the United States, and participants in cartels can be prosecuted under existing anti-trust laws. Patents may not be used to form illegal combinations for the restraint of trade, and the use of patents for such purposes is subject to prosecution under the existing anti-trust laws, just as is any other means or restraint of trade.

(11) What is the distinction between a cartel and a patent license?

A characteristic of a cartel is that it restrains trade. This is the very antithesis of a patent license. When one licenses a patent he waives, to the extent specified in the license, his own right to exclude others from making, using, or selling his invention. Such waiver or relaxation of the patentee's exclusive right in his patent property may be either a simple, unrestricted license or a license in which limited rights only are waived. In neither case does it as such introduce any restraint of trade, and therefore it is not a cartel. Our highest court has recognized that restricted patent licenses come within the category of reasonable control of one's own property, and do not lessen competition.

(12) What is industry's position on cartels?

Industry is opposed to cartels, both domestic and international, whether private or governmental, and it believes in adherence to and enforcement of anti-trust laws. The NAM position on the subject is stated as follows: "Cartel is another word for a monopoly or trust which restricts competition and thus tends to raise prices

to consumers. The National Assn. of Manufacturers stands squarely against cartels of every description, both private or governmental. ... The United States Government and the great majority of its businessmen are opposed to the cartel system. We therefore propose that the United States Government should take the lead and seek to promote voluntary agreements with other nations to prevent the formation or operation of international cartels and should seek the abrogation of those already established."

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(13) What is industry's position on secret international and domestic patent agreements?

NAM, as the spokesman for industry, believes that for the public interest (a) all existing and future patent agreements to which one of the parties is a citizen of a foreign country should be recorded in the U.S. Patent Office, (b) domestic patent agreements to the extent the public interest might be affected should likewise be filed in order to assure adherence to the anti-trust laws, and to remove the unjustified suspicion that manufacturers are entering into secret agreements contrary to public policy.

Such recording would inform the government of agreements made and facilitate protection of the public interest.

(14) Have international patent agreements been beneficial to the United States?

Yes. The knowledge gained from prewar international patent agreements contributed enormously to our prosecution of the war and will contribute to future progress. An example of what this country gained is illustrated from one set of patent contracts made by an American company with a foreign company.

From these we got important information: (a) the first process for producing 100-octane aviation gasoline; (b) synthetic toluol, the basic ingredient of the military explosive TNT; (c) the most modern and efficient methods and apparatus for the manufacture of synthetic ammonia, the other ingredient of T. N. T., from natural gas; (d) Paratone, which greatly improved hydraulic and recoil oils used in every fighting plane, tank, cannon, and ship in the Army,



Photo taken in a large eastern steel mill

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Short swing of wrench locks a Parker Vise all the way around, auto brake fashion.



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The parts that get the hardest wear in a vise are oversize in a Parker Vise and extra tough ...one-piece steel screw and high grade malleable iron nut.



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Navy, and Air Corps; (e) Buna rubber processes, which are the foundation of the American synthetic rubber program; and (f) Butyl rubber, potentially a most important synthetic rubber.

Scores of other examples could be cited.

(15) Are inventions suppressed?

Despite the popular impression that patented inventions are suppressed there is no evidence that such is the case. For example, the late Thomas Midgley, Jr., president and chairman of the board of the American Chemical Society, a few years ago issued an invitation in Industrial and Engineering Chemistry to all chemists to report cases of suppressed patented inventions that they might know, giving the serial number of the patent. Only five alleged instances were reported and not a single case was substantiated after investigation.

Three Commissioners of Patents nave testified at congressional hearings to the effect that they did not know of a single instance of a suppressed invention. These

Commissioners were the recent head of the Patent Office, Conway P. Coe; his predecessor, Thomas E. Robertson; and Thomas Ewing, Commissioner from 1913 to 1917.

Thomas Edison once said at a congressional hearing: "I have heard and read numerous statements that many corporations buy valuable inventions to suppress them, but no one cites specific cases. I myself do not know of a single case."

There are many reasons why a patented invention may not be used, but non-use is different from wilful suppression. Some of the reasons for non-use of an invention are: (a) there may be no immediate market; (b) there may be a better or cheaper means of achieving the same purpose; (c) capital may not be available for immediate commercialization; (d) time and effort may be required to perfect a new product before putting it on the market.

(16) What is compulsory licensing?

Compulsory licensing would compel the holder of a patent to grant licenses to others to produce his invention. Those advocating compulsory licensing would deal with a patent as if it were a kind of public property for which the patent owner should be rewarded but leave to the government the decision as to how it is to be used, to whom it should be licensed, and at what price.

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(17) What would be the effect of compulsory licensing?

The basic argument against compulsory licensing is that it would strike at the very fundamentals of the patent system. By forcing an inventor to give up his exclusive rights before he has an opportunity to reap proper reward, the full incentive which the patent system is intended to give would be largely removed. Further, if the patent holder is forced to license to all who may apply, no company will risk sufficient time, money, and effort to develop a speculative invention to its full potentialities, and society would thus be deprived of the benefits of many new products and processes.

Compulsory licensing would influence the character of research. There would be a tendency for inventors to keep their inventions secret which would defeat the chief purpose of the patent laws—to encourage disclosure.

Compulsory licensing would in effect mean a sharing of private property which is foreign to our American way of life. It would place the emphasis on the division rather than the multiplication of wealth which is essential to higher living standards.

(18) Would compulsory licensing benefit small business?

No. Compulsory licensing would be most damaging to small business and independent inventors as it would destroy their strongest weapon of competition, and would legitimatize piracy of inventions. Large corporations would be given an additional weapon to use in acquiring the inventions of independent inventors and small businessmen to whom patent protection is vital. It would make it impossible for the ingenious inventor to build a business on his patent as so many thousands of small businessmen have.

More than 30 compulsory licensing bills have been introduced in Congress during the last 40 yr. Testimony in hearings on these



AS a result of its wartime activities in manufacturing gun parts, which brought the Army-Navy Award with three stars, the Hendrick plant now has surplus facilities available for making small to medium size precision products to close tolerances.

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bills has been overwhelmingly to the effect that it would be fatal to numerous small enterprises and that small business cannot prosper without the protection afforded by the exclusive right granted by the patent laws.

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(19) Do other countries have compulsory licensing laws?

Yes, notably, England, but the Chartered Institute of Patent Agents, London, England, recently said, "... this Institute is definitely of the opinion that a general system of compulsory licensing of patents is inadvisable on the ground that it would retard the progress of invention."

(20) How do inventions originate?

Most successful inventions are the product of months or years of work. Many result only after severe hardships and discouragement. Few come from accident, and few, if any, from what is called a "flash of genius." Many inventions are the product of an inventor working alone, while others come from work in great industrial laboratories operated by large corporations.

Contrary to popular belief industry gets many of its most revolutionary ideas from independent inventors not connected with a large research laboratory. Many new industries of the last 25 yr have been founded on ideas of independent inventors.

(21) What is the role of the industrial laboratory?

Many important inventions have come from research laboratories operated by industrial companies. Industry's expenditures for research grew 25-fold between 1920 and 1945. In 1940, industry contributed two out of every three dollars spent for scientific research in the United States.

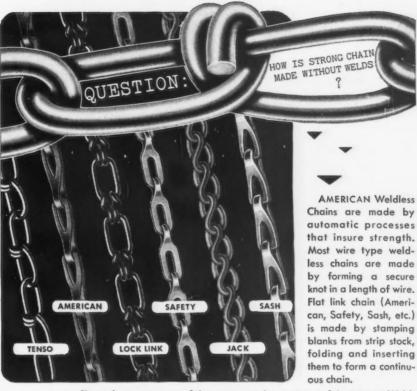
There are now more than 2300 laboratories employing over 70,000 scientists, spending more than \$300,000,000 a yr, and now even faster expansion may be expected. Their work, however, has to a considerable extent been the development and perfection to a commercial stage of ideas originating wholly independent of them.

(22) Are there other research laboratories?

Yes. Research is conducted in many colleges and universities and privately endowed research

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5657 FILLMORE STREET-CHICAGO 44, ILL. Eastern Office: 114 Liberty Street, New York 6, N. Y. institutions. The government also has done extensive research work. G

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(23) What is the role of government research?

Before the war the government spent about \$50 million a yr in research. During the war annual expenditures rose to more than \$600 million for research by the government mostly for military purposes by more than 40 agencies and bureaus in their own laboratories or through contracts with private organizations and educational institutions. The role of the government in research will become increasingly important especially as privately endowed institutions find it more difficult to secure funds under present tax policies.

(24) What is the role of small business in research?

Thousands of small manufacturers devote money, equipment, and time to the creation and improvement of products and processes. In the aggregate, perhaps more time and money are spent on research and development in small companies than in all other companies, institutions, and government agencies combined.

(25) What is the program of NAM?

In order to strengthen the patent system, the program of NAM is directed toward

(a) Minimizing the uncertainty as to the validity of patents

(b) Minimizing the uncertainty as to what constitutes patentable invention, and to bring about greater uniformity in court decisions thereon

(c) Minimizing the delay in the issuance of patents and the consequent delay in the entrance of inventions in the public domain following the expiration of pat-

(d) Reducing the expense and delay involved in patent litigation, including interference proceedings

(e) Combating illegal cartels by recording of patent contracts in the United States Patent Office, to facilitate government investigation of the practices involved and enable the government readily to determine whether they are contrary to public policy, or in violation of anti-trust laws, or in conflict with international policy

(f) Improving Patent Office pro-

Gallup Polls

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Instead of 2 yr. Would you approve or disapprove of this change?"

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Approve .			*			,							40
Disapprove													
No opinion					*		*	*				*	9

Approval of the idea is highest among college trained people who know what the present term is.

Ap- prove Pct	Disap- prove Pct	No opinion Pct
College 52	41	7
High Scholl 36 Grade School or	53	11
No School 39	53	8

• • • As the New York State governorship campaign opens, Gov. Thomas E. Dewey leads his Democratic opponent, James M. Mead, in a statewide poll conducted by the

A substantial number of the state's voters, however-about one in every seven-indicated that they have not as yet made up their minds how they will vote.

The standing of the candidates, with election day nearly 5 weeks ahead, is as follows in the first institute poll on the campaign:

"For governor of New York do you favor the Republican candidate Dewey, or the Democratic candidate Mead?"

Dewey																52
Mead																34
Undeci	d	e	c	1												

The above figures reflect opinion in the early part of the campaign. New surveys will be made at regular intervals and changes of sentiment reported up to the time of the election.

Political observers are watching the New York race closely not only with an interest in who wins, but also in the dimensions of the victory. The race has significant implications for the 1948 presidential election. It is commonly believed in political circles that if Governor Dewey beats Mead by a whopping majority, it will enhance the Governor's 1948 candidacy in the eyes of party leaders. On the other hand, victory for Dewey this November by a narrow squeak only might considerably lessen his standing in the party councils. Of course a Mead victory would pretty effec-

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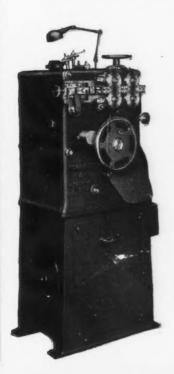
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W-11 SEGMENT TYPE SPRING COILING MACHINE

Wire Diameter Range: .015" to .072" Wire Length per Spring: 0" to 42" Coil Range (O.D.): 3/32" to 1-9/16"

TORRINGTON, CONNECTICUT

tively eliminate Governor Dewey as a 1948 candidate.

The size of Governor Dewey's lead in this poll, and in subsequent polls during the campaign should therefore be of more than usual interest to politically-minded readers.

WAA Names Two For Newly-Created Posts

Washington

• • • Robert M. Field, former officer and director of subsidiaries of the U. S. Steel Corp., has been made Vice Administrator for Staff Operations of WAA. At the same time, Clinton F. Robinson was appointed Vice Administrator for Field Operations. Both positions are newly-created.

In his new position, Mr. Field will direct the activities of the following offices in Washington:

Plans and policies, liaison with owning agencies, general counsel, information and advertising, fiscal services, personnel and office services, acquisitions, general disposal, aircraft disposal, real property disposal, and general review board.

Mr. Robinson, who has been a deputy administrator since he joined WAA in May, will direct the disposal and operational activities of the zone, regional, district and all other field offices.

More Complete Data On Pipe Bidders Required

Washington

• • • WAA has announced that it has requested, in addition to data already on file, information from all bidders on the Big and Little Big Inch Pipe Lines as to the identity and business connections of all individuals or firms associated with the particular bids.

This action was deemed necessary, WAA said, in order to afford WAA officials with the latest and most complete information possible concerning the 16 proposals.

The information requested bears on business and financial connections of all parties actually or prospectively associated with the bidders, but will not in any way duplicate material already filed with WAA during the recent six-weeks' period for substantiation of bids.

The London Economist

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British and French experts to see if they cannot, by common investigation and discussion, work out a compromise acceptable to both governments.

An agreed Anglo-French policy on the Ruhr could, perhaps, provide a new point of departure in the wider German context. To the Russians the Ruhr is the potential military power-house of a new invasion of Russia from the West. The idea may seem fantastic to the Western peoples, but the Russians have been invaded too often from the West to preserve much objectivity. At the July meeting of the Foreign Ministers the most important point in Molotov's statement on Germany was his demand for an international commission to supervise the Ruhr. If the British and French Foreign Ministers had elaborated an explicit plan for the Ruhr's development, it should be possible to fit it into a framework of international supervision. The corollary of such an offer to the Russians would naturally be the setting up of a commission to supervise industrial disarmament and development of the Russian

Another possible line of approach might be to reconsider the vexed question of German foreign trade and economic unity. It is here that American policy can probably make its greatest contribution. Two points need to be made clear. The first is that Russia is taking reparations in plant and in current production from its zone in part because Western Russia has been, and probably still is, more devastated than Eastern Germany. The second point is that for years to come Germany will not be able to finance itself out of its own resources and its own export trade. Russia's reparations policy is an aggravating factor, but even if not a piece of machinery nor a yard of cloth were going eastwards, Germany would still be a crippled, shattered wreck. In spite of Potsdam, in spite of level of industry plans, in spite of all the remnants of idiot Morgenthauism, the basic truth remains that unless the Germans are helped to their feet economicallyby imports of food and raw materials, in other words, by credits-

CHILLED SHOT DIAMOND GRIT

Airless or centrifugal operating machines require Heat-Treated Shot or Heat-Treated Steel Grit.

The ordinary Shot and Grit will not do. They break down too fast and wear away quickly. In other words—expensive at any price.

Our Shot and Grit were made expressly for use in airless machines.

It simply means-

More cleaning at much less cost.

More cleaning and less dust at less cost.

And, remember—any old size won't do.

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If cleaning grey iron, malleable iron, or steel drop forgings, we can save you money.

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Central Europe will remain the slum it is today.

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Economic help in the grand manner can be extended only by the United States, and broadly speaking, there are three policies open to the State Dept. and the Treasury. The first is to turn an isolationist back on Russia, Germany and Europe and to allow the shattered countries to revive themselves without outside assistance. The second is to give credits to the British and American Zones only, with economic and political conditions attached which would favor the restoration in the Western Zones of either the old industrial magnates or the backing of a new business class which is growing up today largely as a result of inflation and the black market. No step would be more calculated to revive neo-Nazi forces in Western Germany or to increase the tension between the

The third possibility would be to develop a loan policy as an instrument of political conciliation. The most hopeful way of reversing Russia's disastrous policy of reparations would undoubtedly be an American credit to Russia. Indeed, a reversal of reparations policy could reasonably be made a condition of the loan. Such a credit has been intermittently under discussion for 3 yr, and on grounds of war devastation the Russian case for it has always been strong. The alternative to a loan — integrating Eastern Europe into the Soviet economy - is obviously a second best from the Russian point of view, since Eastern Europe is also poor and devastated.

A loan to Russia, conditional upon the reversal of Russian reparations policy in Germany, could be a preliminary to a reconsideration of German economic unity. If the fact that Germany must be given some economic assistance is accepted, the only way to provide that help without intensifying the atmosphere of inter-Allied bidding and scheming, would be to make credits through the Control Commission or any other joint agency the Allies may set up—an import-export committee has been suggested, and would serve equally well. The fact that the Western Powers would have to contribute more to such an organization springs inevitably from the wartime destruction of Russia. That the Russians could



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NEW YORK CITY 14

put some resources, for example, timber, into the pool is proved by their present policy towards their own zone and by various provisions of the Potsdam Agreement, but the major economic help would have to come-inevitably-from the United

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The Russian contribution to an atmosphere of détente would be primarily in the political field. For the last year, the Russians have been conducting a political offensive. In their propaganda, in their manipulation of dissident miporities, in their guidance to Communist Parties abroad, they have both conjured up and violently attacked the idea of capitalist encirclement. The result of these tactics has been to make encirclement more of a reality than it otherwise would ever have been. If, however, Marshal Stalin's new readiness to speak of "friendly competition" and the peaceful coexistence of opposed ideologies can be transformed into fact by a reversal of Russia's propaganda tactics, by a new line with Communist Parties abroad, by a truce to specious Security Council accusations and by an end to such senseless activities as the war of nerves on Turkey and Iran, the Russians would have contributed their essential minimum to an Allied "new deal."

To attempt an agenda of conciliation of this sort is, unhappily, to realize how far, as yet, are any of the Powers from the will to achieve it. From the Foreign Office and the Quai d'Orsay it demands an intelligence and flexibility, a foresight and an activity of which there has been almost no evidence in the last year. From Mr. Byrnes and Mr. Snyder it demands a reversal of a credit policy which has tended to become more and more rigid and hostile as "peace" develops. From the Russians it demands a modesty of aims and a generosity of temper which have been conspicuously absent since Stalingrad. From all the Powers it demands a reversal of their German policy which, from Potsdam to Paris, has grown increasingly disunited and confused. Should, therefore, the attempt to make such an agenda be abandoned? Surely the question is equivalent to asking whether the nations are content to abandon the pursuit of peace itself.

FASTENING PROBLEM:

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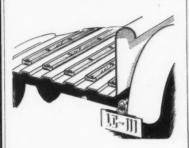
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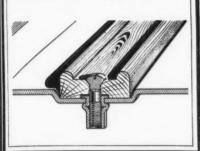
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on is er the on the Save time and space on assembly line attaching wood floor boards to truck floors. Fastenings must be built to resist rough service without jarring loose. Work must be done from one side only.



SOLUTION:

used like this . . .



STEEL B. F. Goodrich Rivnuts were inserted in truck floor holes and upset. Wood floor boards were placed, steel screw attachments entered through holes in boards and screwed into clean threads of the Rivnut. Installation was easily finished by one man working from one side. Time, space and labor were saved on assembly line. If you have a tough fastening problem, perhaps Rivnuts can solve it. Why not learn the whole interesting Rivnut story?

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B.F. Goodrich RIVNUTS

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Survey Shows Disabled Workers Have Better Than Average Records

New York

• • • Handicapped workers are generally better workers than their ablebodied buddies. A Labor Dept. survey of 300 firms and a study of 63,382 handicapped workers disclosed that they beat the average by showing less labor turnover, a better accident record, less absenteeism and higher efficiency.

This is the theme of a drive to show employers that it pays to hire disabled veterans. The total of veterans in this category amounts to approximately 2 million. Included in this figure, aside from the obvious cases, are many who are but partially disabled; who suffer from malaria, deafness and similar ills.

Of this number, the U. S. Employment Service has on its rolls some 225,000 veterans. According to USES sources, these men, though physically handicapped, are well qualified for many jobs. In all, they represent more than 8000 different occupations. The USES has agreed to cooperate by making job analyses and worker appraisals; and finally, by selective placement—"Finding the right vet for the job and the right job for the vet."

Veteran circles insist that these men seek no pity, want no charity; they want jobs where they can be of value to their employers. In the Dept. of Labor survey of 300 employers it developed that 49 pct of the handicapped were absent less frequently than the ablebodied; 58.5 pct stayed on the job longer than the ablebodied; and that 51.1 pct of the handicapped had fewer accidents, while 7.8 pct were more efficient than their ablebodied coworkers. Other details are shown in the accompanying table.

Data Show Disabled Better Than Average Workers

	Better	Same	Worse
Absenteeism	49.0	43.0	7.2
Labor Turnover	58.5	30.8	10.7
Efficiency	7.8	87.0	5.0
Accident Record	51.1	37.7	11.2

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Magnesium Industry Boomed by War; Out To Up Current Sales

New York

• • • The war gave tremendous impetus to the magnesium industry in the United States. Only three companies were producing and fabricating magnesium in 1939. Today there are 54 companies, 50 of which are members of the Magnesium Association.

The actual output of magnesium in this country rose from 3350 tons in 1939 to a peak of 184,078 tons in 1943, remaining at about this figure during 1944 and 1945. Total capacity, including both publicly and privately owned plants, during the war reached a figure of 300,000 tons annually. This capacity was never fully utilized, but it was actually available had it been needed. The government invested \$370 million in building and equipping 13 magnesium plants during the war, a capacity far greater than peacetime industry can absorb. Therefore, these DPC plants have all been declared surplus and are now in process of disposal by the War Assets Administration in line with a policy to keep as many plants as possible in operation in the interests of national defense.

Privately owned plants, since VJ-Day, have been engaged in converting their plants from war to peacetime production and in applying the experience gained in handling and fabricating magnesium during the war into applications for civilian use. A huge stock pile of ingot magnesium still remains as an aftermath of the war so that the problem has resolved itself largely into one of market research, product design, engineering, and sales promotion.

Quoting from the Aug. 22, 1946, issue of "Facts For Industry," published by the U. S. Dept. of Commerce: "The upward trend in shipments of magnesium castings during 1946 continued during June. The June figure of 717,000 lb, the highest since the end of the war, was 8 pct more than the 661,000 lb of magnesium castings

shipped during April. Of the total June shipments, 82 pct were sand commercial castings. On June 30th, unfilled orders for commercial castings amounted to a backlog of six months at the increased rate of shipments."

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Output of cast and wrought magnesium in 1946 has increased from approximately 600,000 lb in January to an estimated 1,500,000 lb in September. Estimates on future production vary from the Surplus Property Administration figures of 25,000 to 33,000 tons annually during the next 5 yr to that of T. W. Atkins, executive vice-president of the Magnesium Association, who predicts consumption at the rate of 100,000 tons annually by the end of 1947.

Properties of magnesium alloys (mostly with aluminum and zinc) which point to greatly expanded uses of this lightest of all structural metal, (one-third lighter than aluminum), are its ease of machinability and deep-drawing, texture and quality of its castings, its high tensile strength, and its resistance to corrosion, plus the fact that one of magnesium's sources, sea water, is inexhaustible. Magnesium can be cast, forged, rolled, drawn, and extruded. The ceiling price on pure magnesium ingot is $20\frac{1}{2}$ ¢ per lb.

Magnesium applications are indicated in general wherever lightness of weight and speed of motion are factors. Current comparison of magnesium with other metals, compiled recently by the Magnesium Association, include the following:

From the manufacturer of an aircraft stabilizer:

 Cost of Material
 Labor Cost
 Total Cost

 Aluminum
 \$40
 \$190
 \$231

 Magnesium
 62
 78
 140

 Magnesium die-castings:

Aluminum Bronze Cast Iron pet higher pet higher pet higher Machining costs . . 25 35 50

Magnesium truck bodies:

Differential in favor of steel \$2,000

The magnesium truck carried a daily payload of 2 tons more than the steel bodied truck, representing a net saving of \$15.60 per day, according to the association. In 128 days the \$2000 price differential was completely liquidated and the lighter weight truck operated thereafter at a 2-ton per day payload profit.



CPA Says Priorities Upped Farm Machinery

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• • • Giving credit to Government priorities aid in obtaining steel, CPA has announced that farm machinery production rose to a record high level of \$66,767,205 in August. compared with \$59,105,779 in July and \$49,178,746 in August of last

Production gains were scored in all but one of the 21 farm machinery classifications listed by CPA, including tractors, harvesting and haying machinery, domestic water systems, dairy equipment and farm machinery repair parts. Dollar volume in tractors totalled \$19,-218,435 or 28,420 units compared with July output of \$16,567,320 or 24,531 units.

Reviewing the distribution of August production, CPA reported that 17.2 pct of the 28,420 tractors produced in August were exported. This represented a substantial drop from the July level of 21.6 pct.

Distribution of tractors for export during these two months are as follows:

	July	August
Canada	10.6 pct	7.2 pct
UNRRA	1.2 pct	.5 pct
Other countries	9.8 pct	9.5 pct
	21.6 pct	17.2 pet

Overall exports of the August output of farm machinery amounted to 7.8 pct compared with 9 pct in July. Only 0.7 pct of total exports were taken by UNRRA in August against 0.9 pct in July.

Meanwhile, OPA has announced that imported farm machinery and equipment will remain under price control even though it was not included in the list specifically exempted from the decontrol action of Sept. 25.

At the same time, OPA restored to its general farm machinery pricing regulation requirements that manufacturers submit to the agency data that has been required in the past. This was said to have been necessary because the requirement for the data was inadvertently omitted when the regulation was amended recently.





Here's the purchasing procedure we recommend for the efficient buying of



STANDARD STOCK ITEMS

